

The following paper was presented for publication :

"List of birds collected in Southern Arizona by Dr. E. Palmer, with remarks by Dr. Elliott Coues, U.S.A."

E. D. Cope made some observations on some specimens of Vertebrata presented by Wm. M. Gabb, of San Francisco, which were procured by him in western Nevada and the northern part of Lower California.

Of reptiles were two undescribed species of Boas, thus increasing the species of the Fauna Nearctica to four, all of which belong to the family Lichanuridæ Cope. The new species belong to *Lichanura* Cope, and are thus characterized: *L. roseofusca*; scales in 36 series, those in the orbital ring seven or eight, the anterior fused into a large preocular. Loreals $\frac{3}{1}$. Color brown above. Belly and especially gular region pink shaded. Length two feet five inches. *L. myriolepis*; scales in 45 rows, those in the orbital ring of equal size, ten in number; loreals $\frac{3}{3}$. Color leaden blue, with three rusty red bands extending throughout the length, but very indistinct on the anterior half of the body.

Of mammalia he noticed a good specimen of the *Lagomys princeps*, from an elevation of 10,000 feet on the Sierra Nevada, near lat. 32°, a locality about 10° further south for the genus than had been hitherto recorded for this continent. Another interesting species was an *Arvicola*, allied to the *A. modesta* of Baird, but not described, from Pigeon Springs, on the eastern boundary line of California, east of Owen's Valley. The characters are as follows: *Arvicola curtata* Cope; one of the smallest species of the genus, differing from *A. modesta* in its much shorter hind foot and tail, in the lower anterior molar with two external triangles instead of three, in the very light color, and other points. Ears well developed, the marginal half loosely furred externally; long silky hairs from the meatus within, on the exterior two-thirds. Anterior lower molar with a posterior triangle, three internal and two external triangles, with an open trefoil. Tail vertebræ a little shorter than the hind foot, and about one-half the head. Hind foot a little over half the head, and five thirds the length of the fore foot. Some long hairs at the bases of the toes, posterior half of the sole densely hairy. Hair on upper surface of feet very long, concealing the claws. Fur rather long, dense, base dark leaden, followed by a light grey, and light brown tip on the upper parts of head and body; general resulting color above light greyish brown; below and feet white.

	In.	Lin.
Length to end tail vertebræ.....	2	9.4
" head, (slightly crushed).....		10.7
" tail vertebræ.....		4.8
" ear from meatus.....		2.
" fore foot.....		3.8
" hind foot.....		6.
" whiskers.....		10.8

On favorable reports of the Committees, the following papers were ordered to be published:

A Monograph of the *ALCIDÆ*.

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"Hinc bonus Moehringivs, boni Brissonivs, Kleinivs, Linnaë cet. sed in medio in omnes veritas et Naturæ ordo!"—*Pallas*.

The *Alcidæ* contained in the collections of the Smithsonian Institution, Washington; the Academy of Natural Sciences, Philadelphia; the Society of Natural History, Boston; the Essex Institute, Salem; and in the private cabi-

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net of Mr. Geo. N. Lawrence, of New York, have been examined in the preparation of the present memoir. The writer tenders his acknowledgements to the officers having immediate charge of these collections, for numerous favors shown him, in a variety of ways, during the prosecution of his researches.

Nearly all the known species of the family are represented in the several collections above named; and the libraries of these Institutions contain all needed works of reference. Being based upon such ample data, this monograph ought to embody all that is known of the *Alcidæ* in a technical point of view, and constitute a fair exponent of the same. The writer ventures to indulge the hope that it may not be found to fall far short of this standard.

Before proceeding to the proper matter of the subject, it may be well to glance at what has already been done in this family of birds. Following is a list, in chronological order, of the principal works in which *Alcidæ* are made more or less of a specialty, with remarks upon each. It is obviously by no means a bibliography of the family; only those works being noticed in which some special point is presented. It may pass, however, for a reviewing sketch of the literature of the subject, and as such may be valuable and helpful to the student. Consultation of most of the works mentioned below is absolutely necessary to a correct understanding of the subject, except in so far as it may be obviated by perusal of the text of the present paper.

I. Review of the Literature of the Family.

Certain species of *Alcidæ* made their appearance in the very earliest ornithological writings of which we have any knowledge, long before the establishment of the science upon any fixed and recognized basis. However desirable it may be—as well in justice to early authors, as tending to bring the whole subject in the strongest light—to collate and identify, as far as possible, the older names of these species, the attempt to cite as authoritative names and descriptions which antedate the foundation of the binomial system of nomenclature would be at once embarrassing and profitless. There must be a fixed initial point for the commencement of authority in the matter of names in the existing system of zoological nomenclature; otherwise a writer might adopt names at pure caprice; in which event the species he treats of would be recognizable only by synonymy adduced, or descriptions appended, and names would fail of their proper purpose by becoming simply indices of the extent of his philological research. The date of the tenth edition of the *Systema Naturæ* furnishes an unobjectionable starting-point, beyond which investigation need only extend from motives of curiosity; and is on several accounts more eligible than the date of the twelfth edition.

Mœhring, a monomial author whose work appeared in 1752, has very frequently been quoted as authoritative, notably, among European authors, by Gray, and among American by Cassin, Baird, Bryant and others, including the present writer. Five genera of *Alcidæ* are instituted in this work of Mœhring's: (1) *Chenalopex*, based on *Alca impennis*; (2) *Spheniscus*, upon *Fratercula arctica*; (3) *Arctica*, upon *Mergulus alle*; (4) *Vria* (sc. *Uria*), upon *U. grylle*; and (5) *Cataractes*, upon *Lomvia troile*. Of these five, *Arctica* and *Cataractes* have never come into use, except in an isolated instance or two; *Uria* is in universal employ, accredited, however, as it should be, to a later writer; *Spheniscus* is used, in an entirely different acceptation, for a genus of Penguins; and *Chenalopex* for an Anserine genus. These names, though all positively identified, will not be countenanced in their Mœhringian acceptation, for reasons just mentioned.

(1758.) LINNÆUS, *Syst. Nat.*, ed. x.—The Linnæan genus *Alca* at this date comprehended six species, to wit: *impennis*, *torda*, "pica," *arctica*, *lomvia*, *alle*. Two Guillemots—*grylle* and *troile*—are presented under the genus *Colymbus*. Excluding from these eight species *Alca* "pica," which is the winter plumage of *torda*, we have at the outset of authoritative records seven Linnæan names, 1868.]

for as many valid species, representing as many distinct genera. The twelfth edition (of 1766) gives us nothing new.

(1760.) BRISSON, *Ornithologia*.—This author gives excellent descriptions of the then known species, but adds no new valid ones, though several stages of plumage are characterized under distinctive names. He was a polynomialist—to our lasting regret, and his great misfortune—and therefore not authoritative in the matter of species. With those, however, who quote him for genera, his *Fratercula* will stand as the name of the genus of which *Alca arctica* Linn. is the type; and his *Uria* for that one typified by *Uria grylle*.

(1764.) BRÜNNICH, *Ornithologia Borealis*.—This author was a strict binomialist; the question of the adoption of his names only hinges upon the acceptance of Linnæus at 1758 or at 1766. Brünnich's names are in general employ, as they should be. The chief point of this work, regarding the Auks, is the characterization of *Uria ringvia*, which, though known long before, had been usually referred to *troille*. Brünnich describes the young or winter plumage of *Utamania torda* under the names "unisulcata" and "balthica;" the young *Fratercula arctica* as "Alca deleta;" the albino *Mergulus alle* as "Alca candida;" various plumages of *Uria grylle* as "grylloides," "balthica," and — (No. 116). Brünnich's "Uria lomvia" is *Colymbus troille* Linn.; his "Uria troille" and "Uria svarbag" are both *Alca lomvia* Linn.; his "Uria alga" is *ringvia* Brünn. in winter plumage. His descriptions, though brief, are all recognizable. (Species now eight.)

(1769) PALLAS, *Spicilegia Zoologica*, fasc. v.—Among the writers of the 18th century, no one contributed so much to a knowledge of the *Alcidæ* as Dr. Pallas. He introduced more new valid species than any other writer, and gave us our first knowledge of some of the curious forms from the North Pacific. His works claim the high eulogium, that every one of the species they contain are identifiable from the descriptions, and that a species is very rarely twice described as new. In the *Spicilegia* four species are for the first time described: *Alca cirrhata*, *A. psittacula*, *A. cristatella* and *A. tetracula*. A white state of plumage of *Uria grylle* (or possibly of *U. columba*) is described as "Cephus lacteolus." The four species above mentioned are well described, and illustrated by plates. (Species now twelve.)

(1785.) PENNANT, *Arctic Zoology*.—Although the author used only vernacular names, his work must be here considered, since in it four species are for the first time presented. These are the "Antient Auk" (for which the author is indebted to Dr. Pallas' MS.), the "Labrador Auk," the "Pigmy Auk," and the "Marbled Guillemot." The second and third of these are very dubious species, which have never been located to the entire satisfaction of ornithologists (cf. *infra*, under head of *Fratercula arctica* and *Simorhynchus pusillus*); the first and fourth are good species. In this work the future *Uria columba* is hinted at, but not named. (Species now fourteen.)

(1788.) GMELIN, *Systema Naturæ*.—In this compilation by the professional plagiarist nothing new is given, but some points require notice. The genera *Alca* and *Colymbus* retain, in general, their Linnæan signification. Pennant's four species, above noticed, appear in proper Latin garb, as *Alca antiqua*, *A. labradorica*, *A. pygmæa* and *Colymbus marmoratus*; Pallas' four species are continued. "Cephus lacteolus" Pallas re-appears as "Colymbus lacteolus." Linnæus' "Colymbus" *troille* is repeated, of course; but the other two species of Murre, though having already made their débüt, are discontinued, unless one of them is intended by a certain "Colymbus minor" Gm., for which Brünnich's Nos. 110, 111, are cited. *Alca* "pica" and *A.* "balthica" are perpetuated. (No additions; species still fourteen.)

(1790.) LATHAM, *Index Ornithologicus*.—This is the one of Dr. Latham's several works in which species are binomialized, and it is therefore the authoritative one. Except in adopting *Uria* (after Brisson), the Index is nearly a repeti-

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tion of Gmelin. We have nothing new, except the first unequivocal indication of *Uria columba* in Latham's "*Uria grylle* Var. B, from Aoonalashka" ("fascia alarum gemina alba," which was "*grylle* Var. A" of Latham's Synopsis, vol. iii.) "*Alca candida*" Brünn. and "*Cepphus lacteolus*" Pallas—both of which are merely albinos—still hold their ground; but the nominal species based upon the plumages of *Utamania torda*, hitherto rampant, subside into "varieties." (Species still fourteen.)

(1790.) BONNATERRE, *Encyclopedie Methodique, Orn.*—Genus *Pinguinus* instituted, with *Alca impennis* L. as type. A certain "*Uria nivea*" is named, for which the author quotes Pallas, Spec. Zool. v. p. 33 ("*lacteolus*"; = albino *grylle* or *columba*).

(1794.) DONNDORFF (JOHANN AUGUST), *Beyträge Zoologische*, zweyter band, erster theil.—The great synonymist of the eighteenth century, as he fairly deserves to be called, gives no descriptions, but laboriously collates astonishing lists of synonyms. In the cases of some well-known birds, the citations stretch over several pages, giving one such an idea of the extent of the ornithological literature of the last century as could hardly be gained from any other work. Donndorff follows Linnæus in his reference of the Auks to two genera, *Alca* and *Colymbus*; the now sub-family *Urinæ* composing his "*Colymbi mit dreyzehigen Füßen*," as distinguished from the four-toed Divers proper. With this author *Alca* "*pica*" and "*balthica*" revive; *A.* "*labradorica*" and *A.* "*pygmæa*" continue in their original significance; Pallas' four species remain, and also his nominal species "*lacteolus*;" five varieties of *grylle* are enumerated, of which Var. "B" is *columba*. By the names "*Colymbus minor*" and "*troile*" the author probably intends to distinguish two species of Murre, but his synonyms are inextricably confused. The var. " γ " of *troile* is, however, unmistakably *r. ngvia* of Brünn.

Such was the general status of Alcidine literature as it came from the hands of the writers of the eighteenth century. We have fourteen well-known valid species, and indications of the fifteenth (*Uria columba*).

(1801.) LEPECHIN, *Nova Acta Petrop.* xii.—*Alca camtschatica* described. (Species now fifteen.)

(1811.) PALLAS, *Zoographia Rosso-Asiatica*.—Dr. Pallas for the second time comes forward to take a long step in advance of his contemporaries, with numerous new species from the North Pacific, and with a more extensive subdivision of the family. Six valid new species are described: to wit, "*Cepphus*" *columba*, "*Cepphus*" *carbo*, "*Alca*" *monocerata*, "*Uria*" *aleutica*, "*Uria*" *dubia*, and "*Uria*" *pusilla*. Four known species are re-named: the Antient Auk being called "*Uria senicula*," the Camtschatkan Auk "*Uria mystacea*," the thick-billed Guillemot "*Cepphus arra*," and the marbled Guillemot "*Cepphus perdix*." "*Cepphus lomvia*," Pallas, equals "*Uria lomvia*," Brünnich, equals "*Colymbus*" *troile*, Linnæus. As in 1769, Dr. Pallas calls the Guillemots all "*Cepphus*;" all the other Auks are consigned to "*Uria*" except the Puffins, for which the generic name "*Lunda*" (after Gesner) is employed. *Alca psittacula* is ranged in this genus. (Species now twenty-one.)

(1811.) ILLIGER, *Prodromus*.—Genus *Mormon* instituted for the Puffins.

(1816.) VIEILLOT, *Analyse*.—Genus *Mergulus* (after Ray) adopted for *Alca alle* Linn. Genus *Larva* instituted for the Puffins. Genus *Alca* "Linn." adopted for *crstatella*.

(1818.) *Transactions of the Linnæan Society*, xii.—Sabine re-names the thick-billed Guillemot, as "*Uria Brünnichii*;" Leach, a few pages further on, bestows another name on the same bird,—"*Uria Francsii*."

(1819.) MERREM.—Genus *Simorhynchus* instituted, with *Alca cristatella* Pallas, as type. (Fide G. R. Gray.)

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(1820.) TEMMINCK, *Man. Orn.*, ii.—Genus *Phaleris* instituted, with *psittacula* Pall. as type; containing this species and *cristatella* Pall.

(1821.) NAUMANN, *Isis*, p. 779, pl. 7.—The three known species of *Fratercula* ("Mormon," Ill.) are reviewed, with figures of the heads. A fourth species, *Mormon corniculatum*, is added. (Species now twenty-two.)

(1823.) LICHTENSTEIN, *Verzeichniss*, etc.—*Alca camtschatica* Lepechen is renamed "Mormon superciliosum." A certain "*Uria Mandtii*" is established, which is frequently quoted as a synonym of *Uria columba*, but appears to be rather an imperfect state of plumage of *grylle*.

(1824-5.) STEPHENS, *Continuation of Shaw's Gen. Zool.*, xii., xiii.—The species of the sub-family *Urinæ* are all included in the genus *Uria*; the type of the genus—*grylle*—is re-named "scapularis." *Phaleris* Temm. is adopted for the *Starikis*, comprehending *psittacula*, *tetracula*, *cristatella* and "pygmæa," the latter being the same as Gmelin's species of that name. *Fratercula* Briss. is adopted for the Puffins, though *Synthliboromphus antiquus* is included in the same genus. *F. glacialis* Leach appears.* Ray's specific name for *Mergulus alle*—*melanoleucus*—is adopted. *Utamania* n. g.,† based upon *A. torda*, is instituted; *Alca* "pica" is also ranged under it as a valid species,—making its last appearance upon the ornithological stage. (Species now twenty-three.)

(1827.) BONAPARTE, *Zoological Journal*, iii.—*Alca monocerata* Pall., redescribed as "*Phaleris cerorhynca*."

(1828.) BONAPARTE, *Syn. Birds U. S. in Ann. Lyc. Nat. Hist. N. Y.* ii.—*Alca monocerata* Pall. redescribed as "*Cerorhinca occidentalis*." In a foot note, under head of "*Phaleris cristatella* Temm.," Bonaparte quotes: "*Alca cristatella* et *pygmæa*, crested or flat-billed Auk, Lath. syn. iii. pl. 95, fig. 4. *Phaleris cristatella* Pl. Color. No. 200.‡ *Alca cristatella* Vieill. Gal. Ois. p. 297." (!)

(1828.) VIGORS, *Zoological Journal*, iv.—"*Uria brevirostris*" named. This is undoubtedly the young of a previously known species of *Brachyrhampus*, but has never been positively identified. It is usually regarded as the young *B. marmoratus*.

(1829.) ESCHSCHOLTZ, *Zoological Atlas*.—Genus *Chimerina* instituted upon *Alca monocerata*, Pall., and the species called "*Chimerina cornuta*." Genus *Ombria* instituted upon *Alca psittacula*, Pall., upon which Temminck had previously based his *Phaleris*.

(1829.) KAUP. ———.—Genus *Cyclorrhynchus* instituted upon *Alca psittacula* Pall. (Fide G. R. Gray.)

(—?) TEMMINCK, *Planches Coloriées*. (No. 579).—"Uria" *Wurmizusume* described and figured. (Species now twenty-four.)

(1837.) BRANDT, *Bull. Sc. Acad. Imper. St. Petersburg*, ii.—During the time between the close of Dr. Pallas' labors and the appearance of Prof. Brandt's paper, there was a great deal of subdividing and re-arranging of the *Alcidæ*, and much sawing of the air in a variety of ways; but, beyond the addition of three species, nothing new or specially noteworthy was put forth. Prof. Brandt originates a new classification of the Auks, (the first one which lays claim to any truly scientific character), institutes several new genera, and describes four new species, besides re-naming some others.

The Auks are primarily divided into two "tribes," called "Pterorhines" and "Gymnorhines." Under the former are ranged the true Auks, the Guillemots, and the Sea-dove; the latter comprehends all the rest of the family. The character is found in the feathering or nakedness of the nostrils. This scheme is spoken of more at length further on, and therefore need not be here criticised.

* This species must have been previously named elsewhere, since Naumann has it in the *Isis* in 1821; perhaps in the *Trans. Linn. Soc.* of 1818, or thereabouts.

† Named in 1816.

‡ Pl. Color. No. 200 represents *camtschatica* Lepechin, not *cristatella* Pallas.

The new genera are numerous. Of these *Brachyrhamphus*, (type *marmoratus*,) *Lomvia*, (type *troile*,) *Synthliboramphus*, (type *antiquus*,) and *Ptychoramphus*, (type *aleuticus*,) are all valid, and were much needed. On the contrary, *Tylo-rhamphus*, (type *cristatellus*,) *Ceratoblepharum*, (type *arctica*,) and *Gymnoblepharum*, (type *cirrhatum*,) were not called for, being antedated respectively by *Simorhynchus* Merrem, (1819,) *Fratercula* Brisson, (1760,) and *Lunda* Pallas, (1811.)

The founding of a subgenus, *Apobapton*, upon the type of *Brachyrhamphus*, is out of order. In the choice of names for the two subdivisions of *Uria* the author is unfortunate in taking the specific designation of the types of these genera, particularly in the case of *Lomvia*, which must stand for the genus of which *troile* is typical, necessitating a change in the specific appellation of one species of that genus, whose synonymy was already overburdened.

The four new species are *Phaleris microceros*, *Brachyrhamphus Wrangelii*, *B. brachypterus*, and *B. Kittlitzii*. Of the three last, *Wrangelii* is only to-day identified; the other two remain unknown, except by Brandt's description. *Brachypterus* is said to have the tarsi longer than the middle toe, which distinguishes it from all the known species of the genus. *Kittlitzii* is evidently a young bird, and probably not a valid species. It is very near *Uria brevirostris*, Vigors, if not the same, and may be the young either of *marmoratus* or *Wrangelii*. The present monograph does not recognize it as valid, leaving only three really new species to be attributed to Brandt's paper.

Brandt identifies and retains *Uria dubia* Pall. under name of *Phaleris dubius*; *Alca pygmæa* Gm. as *Uria pusilla* Pall., under name of *Phaleris pygmæa*. *Uria Wurmizusume* Temm., Pl. Color. 579, is renamed *Brachyrhamphus (Synthliboramphus) Temminckii*. *Alca monocerata* Pall. is renamed *Cerorhina "orientalis"*, probably through a lapsus calami for *occidentalis* Bp. (Species now twenty-seven.)

(1836.) BONAPARTE, *Geographical and Comparative List*.—*Phaleris microceros* Brandt is renamed as *Phaleris "nodi-rostra"*.

(1839.) VIGORS, *Zool. Voy. Blossom*.—*Alca antiqua* Gm. is renamed as "*Mergulus cirrhocephalus*."

(1839.) AUDUBON, *Orn. Biog.* v.—*Colymbus marmoratus* Gm. is renamed "*Uria Townsendii*." Audubon's figure of the supposed adult bird may be really *Brachyrhamphus Wrangelii* Brandt. His figure of the supposed young is really the adult *B. marmoratus*.

(1845.) GAMBEL, *Proc. Acad. Nat. Sc. Phila.*—*Uria aleutica* Pall. is renamed as "*Mergulus Cassinii*."

(1849.) GRAY and MITCHELL, *Genera of Birds*, iii.—A great blemish is the inclusion of the Penguins as a subfamily of the *Alcidæ*, coming in between the *Starikis* and the *Murres*. Otherwise the arrangement here adopted of the *Alcidæ* is as faultless as any ever proposed. Three subfamilies are recognized: *Alcinæ* for the true Auks and the Puffins; *Phaleridinæ* for the *Starikis*; and *Urinæ*, for the Guillemots. (This arrangement is noticed further on in connection with Prof. Brandt's paper, under head of the general characters of the family). *Fratercula* Briss. is adopted for the Puffins; *Phaleris* Temm. for all the *Starikis*, except *Alca monocerata* Pall., for which *Cerorhina* Bp. is used; *Brachyrhamphus* Brandt, in the same acceptation as used by its founder; *Uria* Briss. for the Guillemots; and *Arctica* Moehring, for the Sea-doves. Under the head of the latter, besides *alle*, are ranged *cirrocephalus*, Vigors, and *Cassinii*, Gambel, with the exception of which, the lists of species are very accurate and very full. *Alca pygmæa* Gmel. is identified with *Uria pusilla* Pallas; *Uria Mandtii* Licht. is used for *Cephus columba* Pallas.

(1851.) BONAPARTE, *Proc. Zool. Soc. London*.—A new genus and species described—*Sagmatorrhina Lathamii*, with which *Alca labradoria* Gm. is identified. (Species now twenty-eight.)

(1856.) BONAPARTE, *Comptes Rendus*, xlii.—That portion of the Tableau 1868.]

Comparatif des Pelagiens which regards the Auks represents very nearly the classification now most in vogue, founded by Mr. G. R. Gray. The family is divided into three subfamilies--*Alcinæ*, embracing only two species; *Phaleridinæ*, comprising all the Starikis; and *Urinæ*, including the Guillemots. It is thus the same as Gray's arrangement, except in excluding the Penguins; but in its minor details it is unique in several features. The genus *Pinguinus*, Bonaparte, is adopted, and *Alca* left for *torda*. *Simorhynchus*, Merrem, is taken for its type, (*crisatellus*) and *Phaleris*, Temminck, for its type, (*psittacula*;) the other small Phaleridines are ranged under *Tylorhamphus* Brandt, except *microceros*, which is put under *Ciceronia*, Reichenbach. *Uria* is subdivided into *Lomvia* Brandt for the larger species, and "Cephus" Pallas for the smaller ones. Most of these points are tenable, but some are not. Some very obvious improprieties are evident in the handling of the species. Thus Bonaparte insists on retaining "occidentalis" and "nodi-rostra," two names of his own that he knew were antedated, one by *monocerata* Pallas, and the other by *microceros*, Brandt. *Uria columba* is ranged as a synonym of *grylle*, while *Mandtii* is allowed to take its place. The *Uria* "unicolor" Benicken, which, according to the best authority, is only a state of plumage of *grylle*, is given as a valid species, and referred to a different subgenus. In this paper, as in others written towards the close of the life of the great ornithologist, may be discerned an inclination to lead opinion by the mere weight of a name, or force of personal authority.

(1858.) CASSIN, in *Baird's Birds of North America*.—Bonaparte's article just spoken of is made the basis, in a general way, of Mr. Cassin's paper, but with some important modifications. Only two subfamilies are admitted, *Alcinæ* and *Urinæ*, the former comprehending the Auks proper and the Starikis. *Chenalopez* Moehring is used as a subgeneric appellation for *Alca impennis*. *Mormon* Illiger is used for the Puffins, with *Lunda* Pall. and *Fratercula* Briss. as subgeneric divisions. *Phaleris* Temm. is employed generically for the majority of the Phaleridine forms, with *Simorhynchus* Merrem, *Tylorhamphus* Brandt, and *Ciceronia* Reichenbach, as subgeneric divisions. The erroneous assignment of *Tylorhamphus* is the same as that made by Bonaparte. The forms not included under *Phaleris* are each given independent generic rank. A new species of *Cerorhina* is described—*C. Suckleyi*—for a discussion of which the reader is referred further on. Among the *Urinæ*, the genus *Uria* Moehring is subdivided, after Keyserling and Blasius, into two subgenera—*Uria* proper and *Cataractes* Moehring. *Brachyrhamphus* Brandt is adopted for the Murrelets,* with *Apobapton* Brandt as a subgenus.

This article treats of all the known species of the family, and is, in fact, a monograph of the subject, at once very accurate, and, as far as it goes, complete. Excellent descriptions, in most cases original, are given, together with many synonyms, lists of specimens in the museum of the Smithsonian Institution and Philadelphia Academy, and critical and explanatory remarks. Although the present writer does not endorse all of the opinions maintained in this article, he considers it as by far the best that has ever appeared in print. (Species now twenty-nine.)

(1859.) XANTUS, *Proc. Acad. Nat. Sc. Phila.*—*Brachyrhamphus hypoleucus*, a new species, described. (Species now thirty.)

(1861.) BRYANT, *Proc. Bost. Soc. Nat. Hist.*—"A monograph of the genus *Cataractes* Moehring," with full lists of synonyms, and very accurate descriptions. The family is named "Plautidæ" after Klein. The genus is considered in its restricted sense, including only *troile* Linn., *ringvia* Brünn., and *lomvia* Linn., to which a new species, *C. Californicus*, is added. This is a very valuable contribution. (Species now thirty-one.)

* The present writer proposes this English name for the species of *Brachyrhamphus*.

(1862.) NEWTON, *Ibis*, Oct. From among the many contributions to the Natural History of the Great Auk, this admirable paper is selected for special mention, both as embodying about all that was known upon the subject previous to its publication, and as containing the results of the diligent and careful researches of the author and Mr. J. Wolley, in Iceland. It is probably the best article upon the subject extant; to which the reader may refer in full confidence that he will find an epitome of our present knowledge. Mr. Newton is of opinion that the Great Auk may still live. He attributes the extinction to which it is surely doomed, mainly to direct human interference. The paper is again referred to, and quoted, in the present memoir.

(1867.) SCHLEGEL, *Catalogue of the Museum of the Pays-Bas*, livraison ix. The article "Alca" is in one sense nearly a monograph of the subject, since the greater part of the species of the family are represented in the Museum of the Pays-Bas, and therefore admitted as valid by the author. Unfortunately, however, the author's ultra-conservatism, on matters specific as well as generic, does not allow him to keep pace with the progress of science, and as a consequence, his system of nomenclature and classification is simply curious. One seeks in vain to divine the reason for the maintenance and expression of such peculiar views, unless it be the author's intention to administer a sort of counter-irritant as a remedy against Brehmomania, or to launch a severe satire against the "furor genericus," and other crying evils of the day. Such extreme views, if discreetly indulged for either of the charitable purposes just suggested, are perhaps excusable; the only question is, whether the remedy is not worse than the disease.

Aside from its value as a Museum Catalogue, the present article is chiefly useful for its accurate indications of different stages of plumage, of differences in dimensions of variable species, and as affording some interesting data in the way of locality. The "genus Alca" is made to hold all the *Alcinæ* and all the *Urinæ*. The Stariks appear under the genus *Simorhynchus*; the Puffins under *Lunda*. It is impossible to subject this arrangement to criticism, since in it there is nothing approaching a classification, and arbitrary illogical opinion is not to be brought under critical review. The common Guillemot appears as "*Alca lomvia*," though no point of synonymy is more incontestible than that its proper specific name is *troile*. *Ringvia* is considered as a variety of the same. *Uria columba* is not regarded as valid, apparently because the wing-patch of *Uria grylle* is well known to vary in its characters. *Alca pygmæa* Gm., *Uria pusilla* Pall. and *Phaleris microceros* are thrown together under the common name of "*Simorhynchus pygmæus*." *Alca tetracula* Pall., and *Uria dubia* Pall., are both regarded as the young of *cristatellus*. *Sagmatorrhina Lathamii*, Bonaparte, and *Cerorhina Suckleyi*, Cassin, are both referred to *Alca monocerata*, Pallas. *Mormon glacialis* Leach is not recognized. The *Brachyrhamphi* are not included; but the highly characteristic remark occurs, (p. 21) "Il convient d'étudier de rechef les oiseaux décrits sous les épithètes de Kittlitzii, Wrangeli et brachyptera, et même l'*Alca marmorata*!"

(1867.) SALVADORI, *Descr. Alt. Nuov. Ucc. Mus. di Torino*.—*Uria Craveri* described. This a new *Brachyrhamphus* from California, closely allied to *B. hypoleucus*. (Species now thirty-two.)

Of the thirty-two species noted in the preceding paragraphs, and held to be valid, twenty-eight are contained in the various American collections to which the writer has had access, and are in the present paper identified and described directly from the specimens themselves. The four species not examined are: "*Uria*" *dubia* Pallas; *Brachyrhamphus brachypterus* Brandt; *Sagmatorrhina Lathamii* Bonaparte; and "*Uria*" *Craveri* Salvadori. Of the two last the writer has received some information through private channels, beyond that contained in the published papers; of the two first he knows nothing, except from the original descriptions.

1868.]

A new and very curious species of *Simorhynchus* is described in the following pages, making a total of thirty-three.

II. Of the characters of the Family, and its sub-divisions.

The Auks form a very natural family of birds, distinguished by marked and unmistakable characters from any other. With a single exception,* there is no bird found to present in any notable degree a leaning towards the peculiarities of the *Alcidæ*; and the members of the family, without exception, preserve intact those characters which define the group so trenchantly, showing in no single instance a tendency to aberration. The rigidity with which it is possible to circumscribe the *Alcidæ* is in the highest degree satisfactory, in a class of animals in which the recognition and definition of subordinate groups is peculiarly difficult.

The natural place of the family in our ornithotaxis appears as definite as the characters which separate its forms from other birds. By common consent, the *Alcidæ* are regarded as next to the lowest of birds. The degradation of the type or ideal bird which the Auks represent is only carried further in one family—the *Spheniscidæ*. From the latter, which is at the bottom of the scale, we ascend one step to *Alcidæ*; another brings us to the *Colymbidæ* and *Podicipidæ*. These four families constitute the order *Pygopodes*, or the Brachypterous Natatores. The position occupied by the Auks in this order is so evident as not to admit of question.

It is only necessary to allude to the wings of the *Spheniscidæ*, without dwelling upon the point, to separate this family from the Auks. The tetradactylous feet of the other two families distinguish them with equal facility. Auks are brachypterous, brachyurous, tridactylous natatores, with lateral nostrils. This expression is a perfect diagnosis.

The Auks are confined to the northern hemisphere. Some representatives have been found as far north as explorers have penetrated. The great majority live in more temperate latitudes. A more or less complete migration takes place with most species, which stray southward, sometimes to a considerable distance, in the autumn, and return north again to breed in the spring. A few species appear nearly stationary. The most southern recorded habitat of any member of the family is about latitude 21° N., on the Pacific coast of North America, but this is rather exceptional. The species are very unequally divided between the two oceans. The Atlantic has but few representatives compared with the Pacific. On the northern coasts of the latter the family reaches its highest development; the greatest number of species, of the most diversified forms, are found there, though the number of individuals of any species does not surpass that of several Atlantic species. Comparatively few species are common to both oceans. All the members of the family are exclusively marine.† They are decidedly gregarious, particularly in the breeding season, when some species congregate in countless numbers. Usually one, often two, rarely if ever three eggs are laid, either upon the bare rock or ground, or in crevices between or under rocks, or in burrows excavated for the purpose. Auks are all altrices, and are believed to be chiefly monogamous. The young are at first covered with long soft woolly down; rarely stiffish hairs appear on some parts. The moult is double. The young of the year usually differ from the adults; the latter usually differ in their summer and winter plumages. A very prevalent feature is the possession of crests or plumes, or elongated feathers of a peculiar shape on the sides of the head. All the species walk badly; some scarcely walk at all. The position of the legs with reference to the axis of the body necessitates an upright position when standing. The birds appear to rest on their rumps, with the feet extended horizontally before them, most

* The genus *Pelecanoides*, of the *Halodrominæ* (*Procellariidæ*), in all details of external form, except those of the bill, is essentially like *Mergulus*.

† *Uria grylle* is found on the southern shores of Hudson's Bay; but this fact can hardly furnish an exception to the statement.

of the tarsus touching the ground. The Puffins, however, and a few others, stand well on their feet. All the species but one, fly well, with rapid vigorous motion of the wings, in a straight, firm, well-sustained course. All progress on or under the water with the utmost facility. They are very silent birds; the voice is rough and harsh; the notes are monotonous. They feed exclusively upon animal substances procured from the water.

The uniformity of structure which obtains throughout the family has already been mentioned; the following paragraphs describe this structure in a general way, so far as the details of external form are concerned:*

The general form is stout, compact and heavy. The body is depressed, flattened underneath. The neck is short and thick. The head is large and heavy, usually oval in shape, more or less flattened laterally, more or less drawn out anteriorly, and sloping gradually on all sides to the bill, but sometimes ending abruptly. The plumage about the head is very soft, dense, and short, except those feathers which constitute the peculiar crest or lateral plumes already mentioned. That of the upper parts is very closely imbricated; that of the lower is very thick, compact, elastic, and otherwise eminently fitted to resist the action of water.†

The bill, though constantly preserving certain characteristics, varies to a remarkable degree in the details of its shape. The broad statement may be made, that no two species‡ of the family have bills identical in shape. So unending is the variation in the bill, that in some cases great differences in shape seem of scarcely more than specific consequence, as is especially the case in the genus *Simorhynchus*. The bill in the great majority of species is more or less compressed, sometimes excessively so; it is frequently, however, nearly as wide as high at the base, and more or less subulate. The contour of the bill in many instances deviates from an ordinary standard so much, that the shape may almost be called monstrous. A striking peculiarity of the bill in several genera is the presence of supernumerary elements or accessory pieces, taking the form of salient protuberances. These are usually developed on the culmen; in one instance on the gonys; in one at the angle of the rictus; in several along the feathered base of the bill. Besides these appendages, there are often found grooves and ridges on the sides of one or both mandibles. The culmen is always more or less convex; in one instance it is bi-convex. The tomial edges of the mandibles are more or less sinuate; sometimes nearly straight; usually decurved at the tip, and slightly notched; in one instance recurved. The rictus is ample.§ The mandibular rami approach each other with a very narrow angle, and soon join, producing a long gonys, which is usually nearly straight. One genus has a very convex gonys; in two others the gonys runs the whole length of the bill, there being no mandibular rami proper. The bill is entirely horny, except in two species, in which a soft membrane overlaps the base of the upper mandible; and in a third, where a peculiar knob is not strictly corneous.

The nostrils are basal, lateral, marginal, impervious; usually linear, or narrowly oval; in a few instances placed further from the commissural edge of the upper mandible, and nearly circular. The nasal fossæ are usually very evident; are sometimes hidden by feathers; at others are wholly wanting. The extension of the feathers into the nasal fossæ varies in degree, when it occurs. In just about half the species the nostrils are naked; these usually have no true nasal fossæ. In the other half fossæ occur; entirely obstructed by feathers in three genera; partially covered in the rest. The significance of these features will receive further attention below.

* The writer hopes to bring forward, at some future time, a memoir on the anatomy of the family.

† Cf. Nitzsch's Pterylography for pterylosis of *Utamania torda*.

‡ Is *Uria ringvia* specifically distinct from *U. troile*?

§ In two genera, in which the excessive compression of the bill produces a very constricted rictus, its amplification is provided for by means of a dilatible skin at the angle of the mouth.

The wings are short. In no instance do they, when folded, reach to the end of the tail. In one species they are so undeveloped in their terminal segments* that the power of flight is abrogated. The first primary is always longest; the rest rapidly and regularly graduated; all taper to a sufficiently fine point. The secondaries are very short, and broadly rounded. The primary coverts are very long, reaching much more than half-way from the carpus to the end of the first primary. The first row of secondary coverts reach nearly to the end of the secondaries. The under wing coverts are very long. The axillars are short or wanting. The wing as a whole is convex above, concave below, narrow, sharp, stiff, somewhat falcate. These points of structure are constant throughout the family.

The tail is very short; its length is contained, on an average, about three times in the length of wing from the carpal joint. It is usually slightly rounded, sometimes nearly square, in a few instances pointed; in a few more the central rectrices are slightly shorter than the next pair. The individual feathers are usually very obtuse at the end. Both sets of coverts are long; the inferior usually reach nearly or quite to the end of the tail.

The feet are small, and placed far back, as has been said. The thighs are contained within the general skin of the body. The legs are feathered nearly or quite to the tibio-tarsal joint. The tarsus is short, sometimes excessively abbreviated, rarely equal to the middle toe without its claw, never (?†) longer. It is usually much compressed, is sometimes almost as sharp as that of *Colymbus*, is frequently nearly as broad laterally as antero-posteriorly. Its covering varies with different genera. It is usually reticulate behind and laterally, with a row of scutellæ in front, which rarely, however, if ever, extend its whole length. In some genera it is entirely reticulate; in others, the scutellation extends on one or both sides. The tarsal envelope varies so much that it is not available as a character for subdivisions higher than generic. The toes are very long; the outer and middle always of nearly the same length; the inner shorter, its claw just reaching the base of the middle claw. There is no hind toe. Dissection reveals the rudiment of a hallux, which, however, is never developed sufficiently to make even a well-marked prominence. The webbing of the toes is complete. The claws are all moderately arched, compressed and acute; the inner edge of the middle is more or less dilated; the middle is always the largest, except in two genera, which present the peculiarity of having a very large semi-circular inner lateral claw, which, moreover, lies horizontally instead of vertically.

That rigid adherence to the type of structure just described which all the species maintain, while facilitating the recognition of the family as a family, is a serious obstacle in the way of defining its subdivisions with precision. With no very abrupt transition from one form to another, and without any very marked modification of general features, the minor groups seem to be formed mainly by the varying combination of the few differences in structure which obtain in the family. The assemblage of characters, rather than the presence or absence of particular features, in most cases determines the genera; and no two species are absolutely alike in all points of form.

———"Facies non omnibus una,
Nec diversa tamen, qualis decet esse sororum."

In one of the ablest papers that has appeared upon this subject, Professor Brandt divides the *Alcidæ* into two subfamilies: those with feathered, and those with naked nostrils. In this arrangement the Guillemots stand next to the typical Auk—*A. torda*. Viewed from any other standpoint the two forms

* Cf. Mr. A. Newton's article in the "Ibis" for October, 1862. As there stated, the humerus of *Alca impennis* is of normal size; the antibrachium, carpus and metacarpus, and their quills, are shortened.

† *Brachyrhamphus brachypterus* is said by Brandt to have the tarsus longer than the middle toe.

appear to represent the extremes of structure in the family; particularly in regard to the bill, cultriform in one, subulate in the other. The two types are by most authors placed at opposite ends of the generic chain, and separated by all the *Starikis*. Attentive consideration of all the bearings of the case may very likely result in the opinion, held by the present writer, that the difference between the views of Prof. Brandt and other writers is rather apparent than real. It should be borne in mind that the *Alcidæ* are a family very rigidly circumscribed, and one showing no tendency to aberration, or to connect itself intimately with the families standing next to it on either side. Whether as cause or consequence of this, the fact is indisputable, that the genera of *Alcidæ* are not strung along in a chain whose ends seem as it were to be linked with the genera of other families; they tend, on the contrary, to aggregation in a circle about a common centre. We may take any genus—it matters not which—we shall find its closest ally to the right and to the left; and the circuit shall be complete when all the genera have been considered. To illustrate this point: Prof. Brandt, like all other writers, takes the typical *Alca* as his starting point. With the feathering of the nostrils as a fundamental feature, *Uria* and its subdivisions must come next, then *Brachyrhamphus*; this leading through *Mergulus* into the true Phaleridines, by means of *Ptychoramphus*. Beginning with those Phaleridines with the simplest bills, he progresses to those with more complex bills, ending with *Ombria*, which last, through *Cerorhina*, conducts to *Fratercula*, which ends the series. There is nothing strained or forced in this; the succession of the genera is perfectly natural. But it so happens that *Fratercula* is as closely, or even more closely, allied to *Alca* proper than *Uria* is. We cannot disturb in any essential degree the generic series of Prof. Brandt, but we could with entire propriety go directly from *Alca* to *Fratercula*, and thence backwards over the same track, ending with *Uria*, which would then be at the opposite extreme of the series. It is asserted, without fear of reasonable contradiction, that to begin anywhere in this natural series of genera and progress through it, is to be brought back to the starting point.

It is not, perhaps, possible to divide this generic circle without the exercise of some arbitrary jurisdiction. If there be included in it two or more subfamilies capable of precise definition, the fact has eluded the writer's research. There are, however, in the series two places where a dividing line may be drawn. Prof. Brandt drew but one, relying upon the single character which he found to apply so well, albeit it may be an arbitrary one. Other writers have made likewise but two subfamilies, differently framed however; the *Alcinæ*, including the true Auks, together with the Phaleridine forms, united because of their short, stout, high bills; and the *Urinæ*, separated on the ground of their long, slender subulate bills. Others again, particularly Mr. G. R. Gray and Prince Bonaparte, have drawn two lines, recognizing three subfamilies; and this course appears to be the one that holds closest to nature, provided the family be really susceptible of subdivisions higher than generic. By simply reducing Prof. Brandt's fundamental character to the level of one drawn from the general structure of the bill, three subfamilies stand forth with tolerable distinctness. The *Alcinæ* have feathered nostrils and cultriform bills; the *Phaleridinæ*, naked nostrils and cultriform bills; the *Urinæ*, feathered nostrils and subulate bills. This certainly appears to be a distinction with a difference, and will be so held in the present paper.

The arrangement of the *Alcidæ* here submitted is a modification of Professor Brandt's, providing for the recognition of three in place of two subfamilies. In this particular it is substantially the same as Mr. Gray's, but the sequence of the genera is entirely different, and is nearly that of the first mentioned author. Beginning with typical *Alca* it passes to *Fratercula*, and ends with *Lomvia*, instead of passing to *Lomvia* and ending with *Fratercula*. But in either case the collocation of the genera is essentially the same. It is believed

that this sequence of genera cannot be broken in upon to any considerable degree, without the rupture of a natural series as a consequence.

Family *ALCIDÆ*.

CH.—Tridactylous, brachypterous, brachyurous Natatores, with lateral nostrils.

A.—Subfamily *ALCINÆ*.—Not crested; with feathered nostrils; compressed cultriform bill, much higher than wide at base, without appendages, but grooved on the sides; tail pointed.

1. *Alca*.—Wings rudimental, not admitting of flight.

2. *Utamania*.—Wings fully developed, admitting of flight.

B.—Subfamily *PHALERIDINÆ*.—Usually crested, or with elongated feathers on head; with naked nostrils; bill variable, always compressed, higher than wide at the base, often with appendages; tail nearly even.

3. *Fratercula*.—Inner lateral claw very large, semi-circular, acute, horizontal; bill excessively thin, its base ridged, its culmen simple, with one curve; under mandible grooved; no crest; palpebral appendages; a furrow in plumage behind eyes; tarsi anteriorly scutellate.

4. *Lunda*.—As in *Fratercula*; culmen with an accessory piece, and two curves; under mandible smooth; long crests; no furrow in plumage; no palpebral appendages.

5. *Ceratorhyncha*.—Inner lateral claw normal; bill without a basal rim; base of upper mandible with a prominent upright horn; rami of lower mandible with an accessory piece; head with elongated feathers; tarsus anteriorly scutellate.

6. *Sagmatorrhina*.—Base of upper mandible overlapped by a soft membrane; no accessory piece on lower mandible; otherwise as in *Ceratorhyncha*.

7. *Simorhynchus*.—Bill variable, usually with irregular outline or with appendages; head with a crest or elongate feathers; tarsi reticulate.

8. *Ptychorhamphus*.—Bill stout, conico-elongate, wide at base, acute at tip; base of upper mandible with transverse striæ; upper border of nostrils dilated, flaring; no crests.

C.—Subfamily *URINÆ*.—Nostrils more or less completely feathered; bill elongated, more or less slender and subulate, without appendages or vertical grooves; head not crested, (except in one species.)

9. *Mergulus*.—Nostrils nearly circular, not completely feathered; bill stoutest and shortest in this section; tail much graduated; tarsi scarcely compressed, anteriorly broadly scutellate.

10. *Synthliborhamphus*.—Nostrils broadly oval, incompletely feathered; bill stoutish, but much compressed; tail nearly even; tarsi excessively compressed, anteriorly and internally scutellate.

11. *Brachyrhamphus*.—Nostrils oval, feathered; bill small, very slender; tail short, little graduated; tarsi reticulate, very small and slender, not compressed.

12. *Uria*.—Bill about equal to tarsus; gonys half the culmen; nasal fossæ wide and deep, not entirely filled with feathers; upper mandible with no groove at tip; outer lateral claw grooved; tail contained $2\frac{1}{3}$ times in the wing; tarsi reticulate; no furrow in plumage of head.

13. *Lomvia*.—Bill much longer than tarsus; gonys much more than half the culmen; nasal fossæ long and narrow, completely feathered; upper mandible with a groove at tip; outer lateral claw smooth; tail contained $3\frac{2}{3}$ times in wing; tarsi anteriorly scutellate; a furrow in plumage behind the eyes.

[Jan.

III.—*Descriptions of Genera and Species.*

1. Subfamily ALCINÆ.

ALCA, *Linnæus*.

Chenalopex, Mœhring, Av. Gen. 1752, p. 65, No. 68.

Alca, Linnæus, Syst. Nat. i. 1758; and of authors.

Pinguinus, Bonnaterre, Ency. Method. Orn. 1790, p. 28.

Size largest in the family. Form heavy, compact, robust. Head large, ovate, produced forwards. Neck moderately long, thick. Wings morphologically perfect, teleologically rudimental, not admitting of flight, in length from carpal joint to end of longest primary scarcely twice as long as tail; when folded not reaching the tail. Tail short, pointed. Legs short and stout. Webs broad and full. Tarsi compressed; their anterior ridge and superior surfaces of toes scutellate, lateral and posterior aspects reticulate, the plates on the latter very small. Tibiæ feathered nearly to the joint. Bill about as long as the head, large, strong, very deep, exceedingly compressed. Upper mandible with culmen about straight for half its length, then regularly convex, tip obtuse, declinate, scarcely overhanging; a deep groove on its side at base, parallel with the outline of feathers; its side then perfectly smooth for a space, then deeply impressed with six to ten oblique curved sulci. Gape very large, running far back; line of commissure nearly following that of culmen. Eminentia symphysis slight; gonys nearly straight. Lower mandible two-thirds as deep as upper, its sides impressed with six to ten straight, vertical sulci. Feathers about base of mandibles short, very compact; extending downwards from base of culmen, a little forwards, to commissural edge of upper mandible; reaching much further on sides of lower mandible; wholly covering the moderately long, very narrowly linear, impervious nostrils, which are situated just above the commissure.

It is unnecessary to compare this genus with any other. *Utamania*, most closely allied, is at once distinguished by its teleologically perfect wings, though nearly identical with *Alca* in other points of structure. The only known representative of the genus is remarkable, both for its large size, and for not possessing the power of flight, in consequence of which it may be said to represent, in the Northern Hemisphere, the numerous Penguins of the Southern. By many ornithologists it is believed to have very recently become nearly or quite extinct.

Rigid adherence to the law of priority would necessitate the use of a different name for this genus. "*Alca*" was first applied by Linnæus, in 1744, to the genus of which the bird now called *Fratercula* or *Mormon arcticus* is typical; and even as used by Linnæus in 1758 it has *torda* as its recognized type, according to that rule which regards the species first mentioned as type, when none is otherwise indicated; so that it cannot, with strict propriety, be used at all in this connection. But the name has become so firmly established by common consent and long usage, that it would be ruthless, as well as profitless, to attempt its supercedure by *Chenalopex* of Mœhring, 1752; particularly as this latter word has come into extensive employ for an Anserine genus. The genus *Alca*, as framed by Linnæus in 1758, included both *torda* and *impennis*; and when restricted, by the generic separation of these two types, there seems no good reason why the first mentioned should be regarded as more peculiarly typical of the genus than the last. Should *Alca* be reserved for *Fratercula arctica*, or for *Utamania torda*, it will be apparent that numerous unwarrantable innovations necessarily follow; while its employ in connection with *impennis* entails no such consequences.

ALCA IMPENNIS *Linn.*

Chenalopex, Mœhring, Av. Gen. 1752, p. 65, No. 68. "Rostrum conoides, conuexum, ad latera compressum, aliquot sulcis transuersis canaliculatum. 1868.]

tum," etc. Quotes *Anser magellanicus*, Clus. Worm. Raii, Will. Orn. 242, and *Alcæ species*, Linn. ed. vi, gen. 52.

Alca (Chenalopez) impennis, Cassin, Baird's B. N. A. 1858, p. 900.

Mergus americanus, "Charleton, Onom. Zoic. p. 96, No. 10." "Nieremb. Exot. lib. 10, c. 27," fide Donndorff. Not *Mergus americanus* Cassin, 1853.

Alca major, Brisson, Ornithologia, vi, 1760, p. 85, pl. 7.

Alca impennis, Linnæus, S. N. ed. x, 1758, p. 130, No. 2. Id. *ibid.* ed. xii, 1766, p. 210, No. 2. Quotes *Alca major* Briss. and *Mergus americanus* Clus. Exot. 103. Brünnich, Orn. Bor. 1764, p. 26, No. 105. Gmelin, S. N. 1788, i, pt. ii, p. 550, No. 3. Lath. Ind. Orn. ii. 1790, p. 791, No. 1. Donndorff, Beiträge Zoologische, ii, pt. i, 1794, p. 817. Sander, Grösse u. Schönh. Natur. i, p. 243. Hermann, Tab. Aff. Anim. p. 150. Temminck, Man. Orn. ii, 1820, p. 939. Stephens, Shaw's Gen. Zool. xiii, 1825, p. 51. Bonaparte, Synopsis, 1828, p. 432. Audubon, Orn. Biogr. 1838, iv, p. 316. Brandt, Bull. Acad. St. Petersb. ii, 1837, p. 345. Fleming, Hist. Brit. Anim. 1842, p. 129. Gray, Genera Birds, iii, 1849, p. 637. Thompson, Nat. Hist. Ireland, 1851, iii, p. 238. Macgillivray, Hist. Brit. Birds, 1852, ii, p. 359. Steenstrup, "Vidensk. Middell. for Aaret, 1855; Kjöbenhavn, 1856—57, pp. 33—116." Newton, Ibis, 1862, p. —, (Historical.) Schlegel, Urinatores Mus. Pays-Bas, livr. ix, 1867, p. 13.

Pinguinus impennis, Bonnaterre, Ency. Method. Orn. 1790, p. 29. Bonaparte, Conspectus. Gav. Comptes Rendus, 1856, p. 774.

Description (from the specimen in the Philada. Acad.)—The white spot between the eye and bill is ovate in shape, its upper border a little straightened, its small end towards, but not quite reaching, the bill, its large end extending to, but not around, the eye; the width of the black space between it and its fellow is rather more than half an inch. The back is dusky-black; other dark-colored parts with a good deal of clear brown, especially on the head. The under parts, including the tail coverts, are white, this color running far up on the front of the neck in a narrowly acute angle. The under wing coverts are ashy-gray. The secondaries are narrowly but distinctly tipped with white. The bill is deep black, its sulci dull white. The feet are dark, their precise color at present undefinable.

Dimensions.—"Length about 30 inches;" wing 5.75; tail about 3.00; bill along gape 4.25; chord of culmen 3.15; greatest width of bill .66; greatest depth of upper mandible 1.00, of lower .66; tarsus 1.66; middle toe and claw 3.25; outer 3.00; inner 2.25.

The occurrence of this species on the coast of North America has not been authenticated of late years. Perhaps the last instance on record is that given by Audubon on page 316 of the fourth volume of "Ornithological Biography." "The only authentic account of the occurrence of this bird on our coast that I possess, was obtained from Mr. Henry Havell, brother of my engraver, who, when on his passage from New York to England, hooked a Great Auk on the banks of Newfoundland, in extremely boisterous weather." This specimen was not preserved. "When I was in Labrador," continues Audubon, "many of the fishermen assured me that the 'Penguin,' as they name this bird, breeds on a low rocky island to the south-east of Newfoundland." The present writer received similar assurances when in Labrador in 1860—the place designated being the "Funks." Audubon also states that "an old gunner residing on Chelsea Beach, near Boston, told me that he well remembered the time when the penguins were plentiful about Nahant and some other islands in the Bay."

Two specimens only are known to exist in any American museum. One is in the Philadelphia Academy; its history is uncertain. The other, in the Vassar College, at Poughkeepsie, N. Y., is the original of Audubon's plate and description, as stated in the following note from Prof. Sanborn Tenny, favored in reply to questions regarding it: "The Great Auk, presented to Vassar College by J. P. Giraud, Jr., Esq., is in a perfect state of preservation. This specimen is the one from which Audubon made his drawing, and it was presented

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to Giraud by Audubon himself. Neither Giraud nor myself has further knowledge of it than what is contained in Audubon's works."

Concerning Mr. Audubon's specimen, Mr. Cassin remarks (B. N. A., p. 901), that it was "obtained by him (Mr. A.) on the banks of Newfoundland;" upon which statement Mr. A. Newton (Ibis, Oct., 1862) observes: "In 1857 I was assured by Mr. Bell, the well-known taxidermist at New York, who knew Mr. Audubon intimately, that he never possessed but one specimen of this bird; and if we turn to Prof. MacGillivray's 'History of British Birds' (vol. v. p. 359), we find him saying that he never saw but two examples of the species, one in the British Museum, and 'the other belonging to Mr. Audubon, and *procured by him in London.*'" This serves to throw some little light on the history of the specimen now in the Vassar College, Poughkeepsie, N. Y.

In the Annals and Magazine of Natural History for 1864, p. 235, is given, by Mr. Robert Champley, "a list of the present possessors of the birds, skeletons and eggs of the *Alca impennis*:" this gentleman being cognizant of the existence of twenty-seven skins, six skeletons, and fifty-three eggs. Dr. G. Hartlaub (Bericht üb. d. Leist. in d. Naturg. der Vögel for 1864) remarks upon this enumeration: "Es ist dieses Verzeichniss indessen sehr unvollständig. So z. B. geschicht des schönen Exemplares der Bremer Sammlung so wie des prachtvollen Ei's im Museum zu Oldenburg keine Erwähnung." Mr. A. Newton, on the subject of existing specimens, has (l. c.) the following: "If all the stories we received can be credited, the whole number would reach eighty-seven. I should imagine sixty to be about the real amount;" and again: "It is pretty evident that most of the specimens of the Great Auk and its eggs, which now exist in collections, were obtained from Eldey between the years 1830 and 1844.*

Two eggs are contained in the Philadelphia Academy's collection.

Mr. Alfred Newton's paper in the "Ibis" for October, 1862, entitled "Abstract of Mr. J. Wolley's Researches in Iceland respecting the Gare-Fowl or Great Auk (*Alca impennis*, Linn.)," is exceedingly valuable, being one of the most complete and satisfactory histories of the bird ever published; and may be consulted with the greatest pleasure and profit. The writer is at special pains to correct the very prevalent erroneous impression, that the Great Auk is a bird of high latitudes. His researches warrant his belief that "the Gare-fowl has probably never once occurred within the arctic circle." Mr. Selby's statement (Brit. Orn., ii. p. 433) of its occurrence in Spitzbergen is shown to be unfounded; and notices of its occurrence in Northern Norway and in Greenland are proven to be not wholly worthy of confidence. Mr. Newton brings his extremely interesting history of the bird, as an inhabitant of Iceland, down to the year 1844, when the last birds known to have occurred were caught and killed; and as these may be regarded by some as the last of their race, he gives the particulars of their capture. Mr. Wolley and himself obtained many specimens of bones, but found no traces of the living birds, though he says: "I think there is yet a chance of the Great Auk still existing in Iceland."

UTAMANIA Leach.

Alca, Linnæus, Syst. Nat. 1758; and of most authors. Type *A. torda* L.

Diomedea, Scopoli, 1777, fide G. R. Gray. Not of authors.

Torda, Duméril, Zool. Anal. etc. 1806. Same type.

Utamania, Leach, "Syst. Cat. etc. 1816;" Steph. Cont. Shaw's Gen. Zool. xiii. 1825; and of many authors. Same type.

Size moderate; form stout, compact, heavy; head moderate, anteriorly produced, neck thick. Wings of moderate length, but fully developed, admitting

*"Lists of these, which are in the main correct, though I know of a few that are omitted, have lately appeared in the 'Zoologist' for the present year [1862], pp. 7353 and 7386, and almost simultaneously in the 'Field' newspaper (Nos. 423 and 424, pp. 93, 114). Further remarks on them will be found in the former journal (pp. 7387 and 7438)."—Newton, l. c.

of flight, reaching when folded beyond base of tail; more than twice as long as tail from carpal joint to end of longest primary. Tail rather short, pointed, of somewhat stiffened, acuminate feathers, of which the central pair are elongated and tapering. Legs short, stout; tibiæ bare for a short space above joint; tarsi compressed, anteriorly with a single row of scutellæ, posteriorly and laterally finely reticulate, shorter than the middle toe. Toes long, outer nearly equal to middle, inner much shorter; interdigital membranes broad and full; claws short, stout, obtuse. Bill about as long as head, densely feathered for half its length; feathers on upper mandible extending beyond middle of commissure, nearly as far as those on lower mandible. Bill greatly compressed, its sides flat, with several transverse sulci, its culmen ridged, regularly convex; tip of upper mandible declinate, rather acute; its base encircled by a prominent ridge; gonys about straight; commissure straight to tip, then suddenly deflected. Nostrils just above cutting edge of bill, in its feathered portion, just posterior to basal ridge, impervious, narrowly linear.

Comprising a single species, upon the varying plumages of which numerous nominal species were established by the earlier authors. The employ of the present name for the genus, instead of *Alca* of Linnæus, 1758, is perhaps defensible, upon the grounds alluded to; although the reason for the non-acceptance by authors of *Torda* of Duméril as a generic designation is not apparent. It would be easy to find, among the synonyms of the species, a trivial name to replace *Torda*, should it become necessary to use this as a patronym.

UTAMANIA TORDA, (L.) Leach.

- Alca torda*, Linnæus, S. N. ed. x. 1758, i. p. 130, adult. Id. *ibid.* ed. xii. 1766, i. p. 210; adult. Brünnich, Orn. Bor. 1764, p. 25, No. 100; adult. Gmelin, S. N. i. pt. ii. 1788, p. 551. Latham, Ind. Orn. ii. 1790, p. 793, No. 5. Donndorff, Beytr. Zool. ii. pt. i. p. 819. Scopoli, Bemerk. Naturg. i. p. 81, No. 94. Müller, Zool. dan. Prodr. p. 16, No. 136. Pallas, Zoogr. R.-A. ii. 1811, p. 360. Temminck, Man. Orn. ii. 1820, p. 936. Bonaparte, Synopsis, 1828, p. 431. Audubon, Orn. Biogr. iii. 1835, p. 112; v. p. 428, pl. 214. Gould, B. Eur. v. 1837, p. pl. 401. Brandt, Bull. Acad. St.-Petersb. ii. 1837, p. 345. Peabody, Rep. Nat. Hist. Massach. 1840, ii., Birds, p. 401. Fleming, Hist. Brit. Anim. 1842, p. 130. Gray, Genera Birds, iii. 1849, p. 637. Thompson, Nat. Hist. Ireland, iii. 1851, p. 235. Bonaparte, Consp. *Gav.* Comptes Rend. 1856. Bryant, Proc. Bost. Soc. N. H. May, 1861, p. 73. Schlegel, Urinatores Mus. Pays-Bas, 1867, p. 13. Samuels, Ornith. and Oöl. of New England, 1867, p. 564.
- Alca (Utamania) torda*, Cassin, Baird's B. N. A. 1858, p. 901.
- Pinguinus torda*, Bonnaterre, Ency. Method. Orn. 1790, p. 29.
- Utamania torda*, Leach, Stephens, Shaw's Gen. Zool. xiii. 1825, p. 27; quotes "*Alca Hoieri*, Ray, Syn. 119." Macgillivray, Hist. Brit. Birds, ii. 1852, p. 346. Coues, Pr. A. N. S. Philada. Aug. 1861, p. 249. Boardman, Pr. Bost. S. N. H. Sept. 1862, p. 131. Verrill, *ibid.* Oct. 1862, p. 142. Verrill, Proc. Essex Inst. iii. 1863, p. 160.
- Alca pica*, Linnæus, S. N. ed. xii. i. 1766, p. 210; immature or winter plumage. Pallas, Spic. Zool. v. 1769, p. 12. Fabricius, Fn. Groen, 1780, No. 51. Gmelin, S. N. i. pt. ii. 1788, p. 551. Latham, Ind. Orn. ii. 1790, p. 793, No. 5; var. β and γ . Donndorff, Beytr. Zool. ii. pt. i. 1794, p. 818; quotes "*Mergus Bellonii*, Johnston, Av. p. 225." Müller, Zool. Prodr. p. 17, No. 138. Hermann, Tab. Affin. Anim. p. 225. Pallas, Zoog. R.-A. 1811, ii. p. 361.
- Pinguinus pica*, Bonnaterre, Ency. Method. Orn. 1790, p. 30.
- Utamania pica*, Leach, Stephens, Shaw's Gen. Zool. xiii. 1825, p. 30.
- Alca balthica*, Brünnich, Orn. Bor. 1764, p. 25, No. 101; immature, wanting white line from eye to bill. Gmelin, S. N. i. pt. ii. 1788, p. 551. Müller, Prodr. Zool. p. 17, No. 137. Donndorff, Beytr. Zool. ii. pt. i. 1794, p. 819.
- Alca unisulcata*, Brünnich, Orn. Bor. 1764, p. 25, No. 102; young, not having obtained full size and markings of bill.

Alca minor, Brisson, Ornithologia, vi. 1760, p. 92, No. 3, pl. 8, fig. 2.

Alca glacialis et microrhyncha, Brehm.

Habitat.—European and American coasts of the Atlantic, from the higher latitudes, in summer, to the 40°, or thereabouts, in winter. Very abundant. Specimens in all the American museums, and most private collections. Breeds in great numbers on the islands in the Gulf of St. Lawrence, and on the coasts of Labrador and Newfoundland; in winter strays south to New Jersey. Arctic seas of both hemispheres. Rare, or accidental in the North Pacific. Japan! (Schlegel, Mus. Pays-Bas.)

Adult, in summer.—Iris bluish. Mouth chrome yellow. Bill, feet and claws black; the former with a conspicuous curved vertical white line occupying the middle sulcus of both mandibles, continuous from one to the other. A straight, narrow, very conspicuous white line from eye to base of culmen, composed of a series of very short stiff setaceous feathers, sunk below the level of the others. Secondaries narrowly but distinctly tipped with white. Head and neck all around, and entire upper parts black; this on the sides of the head, chin and throat lustreless, velvety, tinged with fuliginous or brownish; on the upper parts glossy and more intense in color. Inner webs of primaries light brownish-gray at base. Entire under parts from the throat, including under surfaces of wings white.

Adult in winter.—Upper parts lighter, duller, more brownish-black; the white of the under parts extending to the bill, and on the sides of the head and neck, sometimes quite to the nape.

Young, first winter.—Similar to the preceding; smaller, the bill weaker, shorter, less elevated, less decurved at the tip, the culmen, rictus and gonys straighter, the sides of both mandibles smooth, except in the presence of one sulcus; bill brownish-black, the sulcus white. Legs and feet reddish or brownish-black.

Fledgelings.—Bill very small and slender; body clothed with smoky brown or black down, lighter, or tending more or less to grayish-white below.

The white stripe from the eyes to the bill is very variable, though present in the great majority of individuals. It always exists in the adults in summer plumage, but is sometimes absent in specimens, apparently perfectly adult, in winter plumage. Its presence does not seem to be amenable to any very general or constant law: since it may be very evident in very young birds, not yet fully fledged, and again absent in apparently mature specimens, as just stated. In winter specimens it is frequently interrupted and irregular, wanting the sharpness of definition which it has in all cases of adult specimens in summer vesture.

Dimensions: Adult.—Length (average) 18·00, extent about 27·00, wing 7·75, tail 3·50, difference between outer and inner feathers 1·25; tarsus 1·25; middle toe and claw 2·00, outer do. the same, inner do. 1·40; chord of culmen 1·30, its curve 1·50; rictus 2·25; gonys ·75; nostrils to tip ·85; greatest depth of bill, (just anterior to nostrils,) ·90; greatest width of the corneous portion ·30.

Young.—Length 15·00; extent 22·00; wing 7·00; tail 3·00; tarsus 1·00; chord of culmen 1·00; rictus 1·75, gonys ·60; greatest depth of bill ·60; greatest width ·20.

No one of the many synonyms of this species involves any doubtful point, all being based upon the winter plumage, or upon the absence of the white line, or upon an undeveloped condition of the bill. "*Alca pica*" was the most firmly established of these, having held its ground until 1825 or thereabouts.

2. Subfamily PHALERIDINÆ.

FRATERCULA, *Brisson*.

Alca, Linnæus, Syst. Nat. 1744; and in part of subsequent editions; and of the older authors.

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Spheniscus, Moehring, Av. Gen. 1752. Not of authors.

Fratercula, Brisson, Ornith, 1760; and of many authors.

Lunda, Pallas, Zoog. R-A. 1811; in part.

Mormon, Illiger, Prodromus, 1811; and of most authors. Type *Alca arctica* L.

Larva, Vieillot, Analyse, 1816. (Type *Alca arctica* L. fide Gray).

Ceratoblepharum, Brandt, Bull. Acad. Imper. St. Petersb. ii. 1837, p. 348. Type *Alca arctica* L.

Bill rather longer than the head, or than the middle toe and claw, nearly as high at the base as long, exceedingly compressed, the sides nearly vertical, the base of the upper mandible with an elevated horny ridge, entirely surrounding it; the basal moiety of the upper mandible with its sides perfectly smooth, forming an elongated oblique triangle with two curved sides; terminal moiety with three or four deep very oblique curved grooves, from commissure to culmen, their convexity looking forwards. Under mandible without a basal ridge, the basal moiety smooth, the terminal with grooves, in continuation of those of the upper mandible. Culmen commencing on a level with the forehead, thence regularly declinate, very convex, with unbroken curve, its ridge sharp, the tip acutely pointed, overhanging. Rictus perfectly straight, except at the end; the angle of the mouth occupied by a circular callosity of membranous tissue; gonys ascending, slightly sinuate, the keel sharp, terminating posteriorly in a thin, elongated, almost hamular process. Nostrils placed just over the commissure, linear, long, reaching nearly across the base of the smooth triangular space of the upper mandible. No nasal fossæ; both eyelids furnished with prominent callosities, in one species developing into a slender acute process. No crest; a peculiar furrow in the plumage behind the eyes, as in *Lomvia*. Wings of ordinary length and shape. Tail contained two and three-fifths times in the wing; the lateral feathers slightly graduated, the central pair shorter than the next ones. Tarsus very short, only equal to the inner toe without its claw; stout, scarcely compressed, covered with minute reticulations, except for a short space in front, which is scutellate. Outer toe about equal to the middle; its claw shorter than that of the middle; middle claw much dilated on the inner edge; middle and outer claws slightly curved, not very acute, upright; inner claw very large, greatly curved, forming a semi-circle, exceedingly acute, usually lying *horizontal*, not upright.*

A very peculiar, though well known genus of *Alcidae*, without an intimate ally except *Lunda*. The essential characters lie in the structure and configuration of the bill, the rictal and palpebral appendages, and the shape and position of the inner claw; although there are other features involved. *Lunda* is crested, with no furrow in the plumage, no palpebral appendages, and a very differently shaped bill.

Three distinct species represent the genus, as far as known. They are all peculiarly boreal birds, not coming far south even in winter. One is extremely abundant on the shores of the North Atlantic; another inhabits the North Pacific exclusively; another is more particularly a denizen of the Arctic Ocean at large. They may readily be distinguished as follows:

Species, (3).

- I. A slender acute upright horn on the upper eyelid. Black of throat extending to bill..... 1. *corniculata*.

*The peculiar position, no less than unusual shape of the inner claw of this genus is a strongly-marked character, not found in any other except *Lunda*. The great curvature and extreme sharpness of the claw could not be maintained were it vertically placed like the other claws, as it would be worn down by constant impaction against the rocks which the birds habitually alight upon. But in the usual attitudes and movements of the birds it lies perfectly flat on its side, and is so preserved intact. The birds make great use of this claw in digging their burrows or in fighting; and the preservation of the instrument for these purposes is evidently the ulterior design of the peculiar direction of its axis. The birds have the power of bringing it, on occasion for use, into a vertical position. These facts, mayhap, are not generally known. See Pr. A. N. S., Phila., 1861, p. 254.

II. A short blunt process on the upper eyelid. A black ring around the neck, not extending to bill.

Bill moderate; chord of culmen 2.00, the curve 2.10, the ordinate .30; depth at base 1.40 (average), wing 6.50..... 2. *arctica*.

Bill large; chord of culmen 2.40, the curve 2.60, the ordinate .45; depth at base 1.70 (average), wing 7.25... 3. *glacialis*.

FRATERCULA ARCTICA (L.) Steph.

- Alca arctica*, Linnæus, S. N. x. ed. 1758, i. p. 130, n. 3. Linnæus, S. N. xii. ed. 1766, i. p. 211, n. 3. Quotes *Anas arctica*, Clus., *Lunda*, Gesner, *Pica marina*, Ray, *Psittacus marinus*, Anders. Brünnich, Orn. Bor. 1764, p. 25, No. 103. Gmelin, S. N. i. pt. ii. 1788, p. 549, No. 4. Latham, Ind. Orn. ii. 1790, p. 792, No. 3. Blumenbach, Handb. Naturg. p. 228, No. 1. Müller, Prodr. Zool. p. 17, No. 140. Hermann, Tab. Affin. Anim. p. 150. Donndorff, Beytr. Zool. ii. pt. i. 1794, p. 815.
- Lunda arctica*, Pallas, Zoog. R.-A. 1811, ii. p. 365, pl. 83. Schlegel, Urinatores Mus. Pay-Bas. livr. ix. 1867, p. 28. (In part. Confounds *glacialis* Leach with the present species.)
- Fratercula arctica*, Stephens, Shaw's Gen. Zool. xiii. 1825, p. 37. Quotes "*labradora* Gm. Lath." as syn. Fleming, Hist. Brit. Anim. 1842, p. 130. Thompson, Nat. Hist. Ireland, iii. 1851, p. 221. Gray, Gen. Birds, iii. 1849, p. 637.
- Fratercula (Ceratoblepharum) arctica*, Brandt, Bull. Acad. St. Petersb. ii. 1837, p. 348.
- Mormon arctica*, Illiger, Prodr. 1811, p. Naumann, Isis. v. Oken, 1821, p. 783, pl. 7, figs. 5, 6, 7. Audubon, Orn. Biog. iii. p. 105, pl. 213. Oct. Ed. vii. pl. 464. Nuttall, Man. Orn. ii. 1834, p. 548. Bonaparte, Synopsis, 1828, p. 430. Peabody, Rep. Nat. Hist. Mass. 1840, ii. Birds, p. 401. Macgillivray, Hist. Brit. Birds, 1852, ii. p. 365. Coues, Pr. A. N. S. Phila. Aug. 1861, p. 251. Boardman, Pr. Bost. Soc. N. H. Sept. 1862, p. 131. Verrill, Proc. Bost. Soc. N. H. Oct. 1862, p. 142. Verrill, Proc. Essex Inst. iii. 1864, p. 160. Samuels, Ornith. and Ool. of New England, 1867, p. 566.
- Mormon (Fratercula) arctica*, Bonaparte, Comptes Rendus, Apr. 1856, p. 774. Cassin, Birds N. A. 1858, p. 903.
- Mormon fratercula*, Temminck, Man. Orn. ii. p. 933. Gould, Birds Europe, v. 1837, p. pl. 403.
- Mormon polaris et Grabæ*, Brehm.
- Alca deleta* Brünnich, Orn. Bor. 1764, p. 25, No. 104. Young.
- Alca labradorica*, Gmelin, S. N. i. pt. ii. 1788, p. 550, No. 6. Based upon the "Labrador Auk" of Pennant, A. Z. 1785, ii. p. 512, No. 428;* and Lath. Syn. iii. i. p. 318, No. 4. "Hab. in terra Labrador; *Arcticæ* magnit. 12 ferè poll. long. Rostr. angustum, mand. sup. obscurè rubra, inf. albidia nigro maculata; tempora obscurè alba, gula, alæ, et cauda brevis obscuræ, pedes rubri." Bonnaterre, Ency. Method. Orn. 1790, p. 33. Donndorff, Beytr. Zool. ii. pt. i. 1794, p. 817.
- Alca labradora*, Latham, Ind. Orn. ii. 1790, p. 793, No. 4. Same basis as that of Gmelin. "Rostro carinato, mand. inf. gibba, ad apicem macula nigra, oculorum orbita temporibusque albidis, * * color corporis ferè ut in arctica," etc.—Not *Sagmatorrhina labradora* Cassin, which is *S. Lathamii* Bp.
- Spheniscus*, Moehring, Av. Gen. 1752, p. 62, No. 64. Based on "Colymbi species et Alcæ species" of Linnæus' sixth edition. "Rostrum subouatum, lateri-

*The following is Pennant's description:—"With the bill an inch and a quarter long, much carinated at top, not very deep, a little convex; upper mandible dusky, lower whitish, marked with a black spot, and angulated like that of a gull; crown and upper part of the body, wings and tail, dusky; lower part white; legs red. Size of the former," (*Arctica*) "Inhabits the Labrador coast?—Br. Mus."

bus angustissime et perpendiculariter compressis, cutis callosa dura in basi mandibuli superioris. Ad supercilia cornu breue," etc.

Coasts and Islands of the North Atlantic, very abundant. Rare in the North Pacific, (Pallas,) where replaced by *F. corniculata*. In winter, south on the American Coast to Massachusetts. Breeds on the islands in the Bay of Fundy, (Boardman). Numerous specimens in all American Museums.

Adult (breeding plumage).—Iris hazel brown. Eyelids vermillion red, the fleshy callosities bluish ash. Base of bill and first ridge dull yellowish, the smooth contained space bluish, rest of bill vermillion red, the tip of the lower mandible and the two terminal grooves yellowish. Legs and feet coral red, claws black. Crown of head grayish black, the edges of which are sharply defined against the color of the sides of the head, chin and throat, and the posterior edge of which is separated by a very narrow but distinct transnuchal stripe of ashy from the color of the back. Sides of head, with chin and throat ashy white; nearly white between the eyes and bill, and with a maxillary stripe or area of blackish ash on either side of the throat. A narrow, distinct line of white along the anterior edge of the antibrachium. Entire upper parts glossy black, with a bluish lustre, continuous with a broad collar of the same around the sides and front of the neck. Under parts from the neck pure white, the elongated feathers of the flanks and sides blackish. Under surface of wings pearly ash-gray; inner webs of primaries and secondaries dull gray-brown, the shafts brown, blackish at tip and whitish towards the base.

Length 13.50, extent 24.00, wing 6.50, tail about 2.25; tarsus 1.00; middle toe 1.40, its claw .40; outer toe 1.40, its claw .30; inner toe 1.00, its claw .40; bill—chord of culmen 2.00, its curve 2.10; depth of bill at base 1.40; rictus 1.25; gonys 1.45; greatest width of bill (which is at base of nostrils) .60; length of nasal slit .35.

Young.—Bill much smaller and weaker than in the adult; without the basal ridge, and with only slight indications of the warty callosities at angle of rictus; the terminal grooves wanting, or faintly indicated; the culmen much less convex; the gonys convex and ascending posteriorly, without the sharp hamular process at base. Such are the general characteristics of the young, though full-grown bird. Birds not grown have their bill much smaller still, entirely without grooves or ridges, acute at the apex, the culmen and gonys perfectly straight; the lateral aspect of the bill is almost an equilateral triangle. Bill basally blackish; terminally yellowish. Legs and feet reddish yellow, obscured with dusky. The eyelids want the fleshy processes. In colors of plumage the young birds are almost exactly like the parents, except that the ashy of the sides of the head is tinted with sooty black, more or less directly continuous with the black of the crown, and lightening into a dusky ash on the auriculars and lower parts of the sides of the head.

Nestlings are covered with blackish down, becoming whitish on the under parts from the breast backwards.

This species presents little variation in any respect from the conditions as above described. The dimensions do not vary much, and even the bill is very constant in size, shape and colors. The plumage of the adults scarcely presents appreciable variation.

The protuberance on the lower eyelid is horizontal, and occupies the whole length of the lid. That on the upper eyelid is nearly perpendicular, and higher than broad; but is short, obtuse and never developed into an acute process.

There is absolutely no difference between American and European specimens. The foot note on page 251, Pr. A. N. S. Phila. for 1861, is to be cancelled as wholly erroneous.

No bird of the family of *Alcidæ* is better known than the present species. It is the type of the Linnæan genus *Alca* of 1744, but not of 1758, nor of subse-

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quent editions of the "System." Though so long known, it has few synonyms beyond those resulting from its reference to divers genera. Alca "deleta" Brünnich, is the young bird. So also, beyond a doubt, is the Alca "labradorica" of Gmelin, which has been so differently interpreted by various authors. Bonaparte even says it is *certainly* his *Sagmatorrhina Lathamii*, though he does not adopt the name *labradorica*, as it would imply a geographical error. Mr. Cassin, however, uses it in connection with the *Sagmatorrhina*. It is based upon the "Labrador Auk" of Pennant. The diagnosis of this author, and that given by Gmelin and Latham, are reprinted above, for facility of reference. If the reader will take the trouble to study these three descriptions, he will not be likely to regard them as diagnoses of *Sagmatorrhina Lathamii*.

This species is the type of Moehring's genus *Spheniscus*; and a person addicted to iconoclasm in the matter of nomenclature might cut a fine dash on the strength of this fact.

FRATERCULA GLACIALIS, Leach.

Mormon glacialis, "Leach," Naumann, Isis, 1821, p. 782, pl. 7, fig. 2. Not of Audubon and Gould, who figure and describe *corniculata*. Newton, Ibis, 1865, p. 212. Malmgren, Cab. Journ. f. Ornith. xiii, 1865, p. 394; critical discussion of relationships to *arctica*.

? *Mormon glacialis*, Bonaparte, Synopsis B. U. S. 1828, p. 429. Probably only *arcticus*. Boardman, Pr. Bost. Soc. Nat. Hist. Sept. 1862, p. 132; and Verrill, Proc. Essex Inst. iii, 1864, p. 160. Grand Menan, Bay of Fundy. These two authors rely for the locality upon Audubon's authority, very questionable in this instance.

Fratercula glacialis, Leach, Stephen's Cont. Shaw's Gen. Zool. xiii, 1825, p. 40, pl. 4, fig. 2. Gray, Genera Birds, iii, 1849, p. 637.

Mormon (Fratercula) glacialis, Bonaparte, Tab. Comparatif Pelagiens, Comptes Rendus, xlii, 1856, p. 774. Cassin, Baird's B. N. A. 1858, p. 903.

Lunda arctica, Schlegel, Urinatores Mus. Pays-Bas, ix. livr. 1867, p. 28, in part; "Specimina aliquantulum majora ex insula Spitzbergen."

Coasts of the North Atlantic; but a more boreal species than *F. arcticus*; Arctic Ocean. Spitzbergen. Near Port Foulke, Greenland, (Mus. Smiths. Inst.), "Europe," Greenland, (Mus. Acad. Philada.) Not authenticated as occurring on the coast of Maine.

(No. 24,302, Mus. Smiths., near Port Foulke, Greenland, Aug., 1861; adult; Dr. I. I. Hayes.) With the colors, and much the general aspect of *F. arcticus*. Larger than that species. Protuberance on upper eyelid more decidedly acicular; in fact intermediate in size and pointedness between that of *F. arctica* and *F. corniculata*. Bill much larger, comparatively and absolutely, than that of *arctica*, and differently shaped; its colors about the same. Bill very deep at the base, the basal ridge rising high on the forehead; culmen much arched, towards the end dropping nearly perpendicularly downwards, so great is its convexity. Upper mandible with four decided grooves; the lower with three, being one more on each than is usual in *arctica*. Gonys more convex in outline, yet not produced posteriorly into so acute a hamular process. Length 14.50; extent about 26.00; wing 7.25; tail 2.25; tarsus 1.20; middle toe and claw 1.90, outer do. 1.90, inner do. 1.45; bill: chord of culmen 2.40, its convexity 2.60, ordinate of the curve .45; depth of bill at base 1.70, length along rectus 1.50, along gonys 1.60; greatest width of bill .65; length of nasal aperture .40.

The development of the bill, changes of plumage, and individual variations of this species are doubtless identical with those of *arctica*. Young birds of the two species might not be satisfactorily distinguishable.

Though this species is so very near *arctica* it is probable that the majority of authors would accord to it specific rank. It is apparently larger in all its parts; the callosity on the upper eye-lid tends in shape towards that of *corniculata*; the bill is not only much larger every way than that of *arctica*, but has

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a decidedly different shape, owing chiefly to its greater depth at base, as compared with its length, and much greater convexity of culmen. The only questionable relationship is with *arctica*; the bird is certainly not *corniculata*.

This species is usually cited by New England writers as occurring off the coast of Maine in winter. (Grand Menan, entrance of the Bay of Fundy.) In this, however, they only quote Audubon's authority, which is not reliable in this instance, as he himself says that he "rather supposed than was actually certain that the birds observed were large-billed Puffins." The case is rendered still more problematical by the fact that Audubon's "Large-billed Puffin, *Mormon glacialis* Leach," is really the *corniculata* Naumann, described and figured from specimens procured in London, from Mr. Gould, who also, in the "Birds of Europe," mistakes the true *glacialis* Leach for *corniculata* Naumann. Subsequent writers will do well to expunge the name of this species from their local lists of the birds of New England. It is exceedingly improbable that the true *corniculata* occurs on the New England coast.

This species is usually cited as having been introduced in Stephens' Continuation of Shaw's General Zoology (1825); but must have appeared some years previous, since Naumann quotes "*Mormon glacialis* Leach," in the *Isis*, 1821. It was probably named by Leach about 1816-18.

FRATERCULA CORNICULATA, (*Naumann*), *Gray*.

Mormon corniculata, Naumann, *Isis* v. Oken, 1821, p. 782, pl. 7, figs. 3, 4. (Kamtschatka.) Cassin, *Pr. A. N. S. Philada.* 1862, p. 324. (Behring's Straits.)

Mormon (*Fratercula*) *corniculata*, Bonaparte, *Comptes Rendus*, 1856, p. 774. Cassin, *Baird's B. N. A.* 1858, p. 902.

Fratercula corniculata, Gray, *Gen. Birds*, iii, 1849, p. 637, pl. 174.

Fratercula (*Ceratoblepharum*) *corniculata*, Brandt, *Bull. Acad. St. Petersb.* ii, 1837, p. 348. Quotes "*Mormon corniculatum*, Kittlitz, Kupfer, i."

Mormon glacialis, Audubon, *Orn. Biogr.* iii, 1835, p. 599, pl. 293, fig. 1. *Id. B. Amer.* vii, p.—, pl. 463. Not of authors. Gould, *Birds Eur.* v, 1837, pl. 404. Not of authors.

? *Fratercula glacialis*, Vigors, *Zool. Voy. Blossom*, 1839, *Ornith.* p. 33. Probably not true *glacialis*.

Lunda corniculata, Schlegel, *Urinatores Mus. Pays-Bas*, livr. ix, 1867, p. 28.

Coasts and Islands of the North Pacific and Arctic oceans. Kamtschatka, (*Mus. Acad. Phila.*) Sitka, (*Schlegel, Mus. Pays-Bas.*) Kotzebue Sound, and St. Michael's, Russian America, (*Mus. Smiths. Inst.*) Southern extension on west coast of America not determined. Not recorded from the North Atlantic.

Adult, breeding plumage. (No. 46,503, *Mus. Smiths.*, St. Michael's, Russian America, June 27, 1866; H. M. Bannister.) Bill very large, especially high at the base for its length, the height being about equal to the chord of the culmen, exclusive of the width of the basal rim; base of culmen and angle of gonys both produced far backward, giving a greatly curved outline to the base of the bill along the feathers of the sides of the head; sides of the bill not distinctly divided into two compartments; nearly plane and smooth in their entire length, with only three faintly pronounced short grooves; culmen exceedingly convex, regularly arched in the arc of a perfect circle; the tip of the upper mandible acute, moderately overhanging, the basal rim broad and prominent; rictus (not including the part beyond the basal rim of the upper mandible) very short, only equal to the height of the upper mandible at base; gonys sinuate, at first convex in outline, then slightly concave; its length but little less than the chord of the culmen.*

Appendage of the upper eye-lid produced into a long, slender, acutely pointed

* The lower mandible in this specimen is so thin near the angle of the gonys as to be transparent. Ordinary type can be read through it.

upright spine; that of the lower eye-lid much as in other species of the genus.

Form otherwise as in *F. arctica* and *glacialis*. Larger than the former, about the size of the latter.

Crown of the head deep grayish black; the patch of this color triangular in shape, narrowing anteriorly to a point at the base of the culmen. Sides of the head white; the furrow in the plumage behind the eye, and the sides of the lower jaw tinged with dark ash. A narrow distinct line of white along the edge of the fore-arm. Entire upper parts very glossy blue-black; a duller, more fuliginous shade of black encircling the neck before, and running forwards on the throat and chin quite to the bill. Other under parts pure white, except a few elongated blackish feathers on the sides and flanks. Under surface of wings dark pearly ash. Legs and feet orange red, the webs tinged with vermillion. Claws brownish black. Palpebral appendages apparently ashy black. Bill yellow, tinged with red, the terminal portion blackish. Rictal callosities brilliant yellow orange.

Length 14.50; extent 24.50; wing 7.25; tail 2.75; tarsus 1.10; middle toe and claw 2.00; outer do. 1.90; under do. 1.35; bill: chord of culmen 2.00, its curve 2.25; rictus from basal rim to tip 1.20; gonys 1.75; depth of bill at base 1.80; its greatest width .60; length of nasal slit .40; length of superior palpebral appendage .35.

This interesting species may be recognized at a glance by the prominent horn over the eye, and the extension of the black collar on the throat to the bill. The bill also differs from that of either of the other species in its shortness, compared with its great depth at the base, and the nearly smooth sides, which are not distinctly divided by a ridge or groove into two compartments. The bill is also comparatively thinner than that of the other species, and differently colored.

Prof. Naumann first described this species from Kamtschatka in his valuable memoir on the genus in the *Isis*, as above cited. It has been occasionally confounded with *glacialis* Leach, which is quite a different bird. It is a North Pacific and Arctic species, not recorded from the Atlantic. Excellent specimens are contained in the Philadelphia Academy and Smithsonian Institution; one of those in the collection of the last named is probably the original of Audubon's plate of "*glacialis*."

LUNDA, *Pallas*.

Alca, Pallas, Spic. Zool. v, 1769; in part; and of some older authors.

Lunda, Pallas, (ex Gesn.) Zoog. R.-A. 1811. Type *Alca cirrhata*, Pallas.

Mormon, Illiger, Prodrôme, 1811; in part; and of most authors.

Fratercula, Stephens, Shaw's Gen. Zool. xiii, 1825; in part; not of Brisson.

Gymnoblepharum, Brandt, Bull. Acad. Imper. St. Petersburg, ii, 1837, p. 349.

Type *Alca cirrhata*, Pallas.

With somewhat the general aspect of *Fratercula*. No horny appendages to the eyelids. No furrow in the plumage behind the eyes. An extremely elongated crest on each side of the head. Upper mandible with only an indication of a basal ridge along its sides; the culmen divided into two parts, whereof the basal is surmounted by a prominent widened ridge, ending abruptly; sides of upper mandible with three well marked curved grooves, widely separated, whose convexity points backwards. Under mandible with its sides perfectly smooth, and its base very convex, not concave. Rictus very sinuate; gonys slightly curved. Feet, wings and tail as in *Fratercula*.

The above diagnosis indicates only the principal features wherein this genus—or subgenus, as might be contended with some reason—differs from *Fratercula*. Except in the bill, eye-lids and crest, the genus is exactly *Fratercula*, but the differences in these points seem sufficient to warrant generic separation.

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LUNDA CIRRHATA, Pallas.

Alca cirrhata, Pallas, Spic. Zool. 1769, v, p. 7, pl. 1, and pl. 2, figs. 1, 2, 3. Quotes Steller, Nov. Comm. Petrop. iv, p. 421, pl. 12, fig. 16. Gmelin, S. N. i, pt. ii, 1788, p. 553. Quotes Pennant, A. Z. ii, p. 513, No. 432. Latham, Ind. Orn. ii, 1799, p. 791, No. 2. Donndorff, Beytr. Zool. ii, pt. i, p. 822, No. 10. Quotes *Anas arctica cirrhata*, Steller. Sander, Grösse u. Schönh. in Natur. i, p. 244. Hermann, Tab. Aff. Anim. p. 150; and of the other early authors.

Lunda cirrhata, Pallas, Zoog. R.-A. ii, 1811, p. 363, pl. 82. Schlegel, Urinatores Mus. Pays-Bas, 1867, p. 27.

Mormon (Lunda) cirrhata, Bonaparte, Comptes Rend., 1856, p. 774. Cassin, Baird's B. N. A. 1858, p. 902.

Mormon cirrhata, Bonaparte, Syn. 1828, p. 429. Audubon, Orn. Biogr. iii, 1835, p. 361, pl. 249, figs. 1, 2. (Kennebec R., Me.) Audubon, B. Amer. vii, 1844, p. —, pl. —. Boardman, Proc. Bost. Soc. N. H. 1862, p. 132. (Maine). Verrill, Proc. Essex Inst. iii, 1864, p. 160. (Maine). Heermann, Pac. R. R. Rep. x, 1859, Route to California, Birds, p. 75. Cooper and Suckley, Pac. R. R. Rep. xii, pt. ii, 1859, p. 283.

Mormon cirrata, Naumann, Isis, 1821, p. 781, pl. 7, fig 1.

Fratercula cirrhata, Stephens, Shaw's Gen. Zool. xiii, 1825, p. 40. Vieillot, Gal. Ois. ii, 1825, p. 240, pl. 296. Vigors, Zool. Voy. Blossom, Ornith. 1839, p. 33. Gray, Gen. Birds, iii, 1849, p. 637. Cassin, Pr. A. N. S. Phila. 1862, p. 324.

Fratercula (Gymnoblepharum) cirrata, Brandt, Bull. Acad. St. Petersb. ii, 1837, p. 349.

Arctic Ocean; Coasts and Islands of the North Pacific; on the American side south to California; of occasional occurrence on the Atlantic Coast of North America, (Kennebec River, Audubon: spec. obtained; Bay of Fundy, in winter, Verrill.) Spec. in Mus. Acad. Philada., Mus. Smiths., Cab. Geo. N. Lawrence, author's Cab., etc.

Bill very large and heavy, much longer than the head or middle toe and claw, its depth at base three-fourths its length; excessively compressed, the sides nearly perpendicular, except at base of upper mandible, where they bulge a little. Upper mandible divided into two portions; the basal part with its sides perfectly smooth, bounded along the base by a slight oblique ridge of subcorneous tissue, which is scarcely, however, elevated above the common plane, and is minutely studded with points; bounded above by a prominent wide ridge formed of an accessory corneous piece which surmounts this portion of the culmen; bounded below by the nasal slit; bounded anteriorly by a deep groove whose convexity looks backwards; these four boundaries enclosing a subtrapezoidal space. The terminal part smooth, except in the presence of three widely separated, oblique, curved, deep grooves, whose convexity looks backwards. Lower mandible with the sides perfectly smooth, the base convex, the convexity looking backwards, with slight indication of a ridge of punctulated subcorneous tissue. General outline of culmen convex; this convexity, however, interrupted near the middle by a notch, forming a re-entrant angle between the two parts of the culmen, each of which, taken separately, is convex in outline—the anterior part the most so. Rictus exceedingly sinuate, the tip of the upper mandible being almost perpendicularly hung over that of the lower; the angle of the mouth occupied by a large fibrous or membranous excrescence, nearly circular in outline, turgid in life; in the dry state shrunken and minutely punctulated. This peculiar warty excrescence seems of nearly the same structure as the base of the bill itself, with which it is directly continuous. Nasal slit short, linear, subbasal, placed close to the commissural edge of the upper mandible. Palate and floor of mouth both deeply excavated; the cutting edge of both mandibles exceedingly sharp.

The eyelids are naked along the edge, but present no thickening or unusual

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fleshiness. The crest springs chiefly from what would otherwise be a naked linear groove in the plumage from the eyes to the extreme occiput. Some of the feathers begin to grow much above, if not a little anterior to, the eyes. The crest in perfectly adult birds is more than *four* inches long. The feathers have exceedingly slender, delicate shafts, and loose, entirely disconnected, though quite lengthy fibrillæ; and a peculiar silky glossiness.

The wings are of the usual size and shape in this family. The tail is comparatively somewhat longer, perhaps, than in any other Alcidine bird; the lateral feathers a little graduated; the central pair shorter than the next, producing an emargination. The legs are as in *Fratercula*. The claw of the inner toe presents the curious character which has already been dwelt upon in connection with *F. arctica*.

Adult.—Bill orange-red; the basal moiety of both mandibles livid horn or enamel color; the punctulated basal ridge, and rictal callosities more yellowish. Legs and feet obscure reddish; the webs bright coral red; claws brownish-black. Edges of eyelids red; "iris pale blue." Crests pale straw-yellow; some of the posterior feathers, which grow from the black part of the head, black at base. Face pure white, abruptly defined. This white occupies the lores and sides of the head to the base of the crest, and encircles the bill, broadly on the sides, narrowly above and below. The black of the crown comes down the forehead to within a fourth of an inch of the culmen; just filling the crown between the crests, and ending with a directly transverse outline. The white on the side of the lower jaw extends to within about the same distance from the under mandible. A narrow, very distinct pure white line along the anterior edge of the fore-arm. Entire upper parts, and under tail coverts glossy black; sides of head and neck, and throat and breast fuliginous brownish-black; other under parts the same, but more grayish; under surfaces of wings smoky gray. Wings and tail black; the inner webs of the feathers brownish-black; the shaft of the first primary whitish on its under surface towards its base.

The preceding description is taken from an unusually fine specimen (No. 46,494, Mus. Smiths. ♂, Sitka, May, 1867), representing the very highest condition of maturity. The crest is more than four inches long. It is not often that such very perfect specimens are met with in collections.

Length between 15.00 and 16.00; wing 7.75; tail about 2.00; tarsus 1.30; middle toe 2.00, its claw .50; outer toe 1.80, its claw .40; inner toe 1.25, its claw .50; bill: greatest depth (a little in front of extreme base) 1.90; greatest width (at angle of mouth) .90; chord of culmen 2.40, of which the terminal portion is 1.40; rictus about 1.90; gonys 1.60; greatest depth of upper mandible 1.15; nostrils .25 long.

Young (full grown).—Bill smaller than in the adult, and not so deep at the base; sides of terminal moiety of upper mandible perfectly smooth; chord of culmen 2.00; depth of bill at base 1.40. No crest; slight indications of it in some short yellowish filamentous feathers on the auriculars. White line on fore-arm imperfect. White about head as in the adult; but the black reaches nearly or quite to the base of the culmen and gonys. Otherwise like the adult; the under parts rather more grayish. The bill and feet appear to have been less brightly colored.

This strange bird fairly disputes with *Phaleris psittacula* the claim to be regarded as the oddest of the odd species of this family. The peculiar configuration of the bill strongly characterizes it at all ages, independently of its remarkable head-markings. Though known for about a century, it has received no specific synonyms from any of the writers whose works have been examined in the preparation of the present memoir. Specimens are contained in nearly all the American collections. The bird is authenticated as occurring on the coast of Maine.

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CERATORHYNCHA, Bonaparte.

Alca, Pallas, Zoog. R.-A. ii, 1811, in part; not of authors.

Phaleris, Bonaparte, Zool. Journ. iii, 1827; not of authors.

Cerorhinca,* Bonaparte, Syn. U. S. Birds, 1828. Type *C. occidentalis*, Bp. = *A. monocerata*, Pall.

Chimerina, Eschscholtz, Zool. Atlas, 1829. Type *C. cornuta*, Esch. = *A. monocerata*, Pall.

Uria, Audubon, B. Am. vii, 1844, in part; not of authors.

Simorhynchus, Schlegel, Mus. Pays-Bas, 1867, livr. ix, in part; not of Merrem.

Base of upper mandible with a large upright horny protuberance. Under mandible with an accessory corneous piece interposed between its rami, near their symphysis. Bill shorter than the head, stout, very deep at the base, tapering rapidly to the tip, much compressed, the sides erect, smooth, the culmen very convex, the rictus gently curved, the gonys nearly straight, except at symphysis, where it is bulging. Nostrils short, linear, subbasal, marginal, impervious. Eye small; no palpebral appendages. No crest; no furrow behind the eyes; slender elongated feathers on each side of the head. Inner lateral claw of usual size, shape and position. Other details of form almost exactly as in *Fratercula*. Size large; general form robust.

This curious genus may readily be distinguished from all others of the family by the characters indicated in the two first sentences of the above diagnosis. The intercalation of an accessory corneous element at the mandibular symphysis is an entirely unique feature in this family. It seems very much like the "interramicorn," as the writer has elsewhere called it, which is found in the albatrosses, as one of the characters which distinguish those birds from other *Procellariidæ*. In the present instance, it is a feature of especial importance and value, as it helps greatly to distinguish this genus from *Sagmatorrhina*, or, to be more explicit, to separate *S. Suckleyi* from *C. monocerata* in every stage of growth.

The affinities of this genus are decidedly with *Fratercula*, after *Sagmatorrhina*, of course. Aside from the peculiarities of the bill, it agrees with the former in most points of structure, except the eyes and inner lateral claw. It does not require comparison with any other genus. It is represented by only a single species, according to the writer's way of thinking,—*Suckleyi* falling most naturally, as well as can be judged at present, in *Sagmatorrhina*.

CERATORHYNCHA MONOCERATA (Pall.) Cass.

Alca monocerata, Pallas, Zoog. R.-A. ii, 1811, p. 362, No. 414.

Cerorhina monocerata, Cassin, Baird's B. N. A. 1858, p. 905. Cooper and Suckley, Pacific R. R. Rep. xii, pt. ii, 1859, p. 284.

Simorhynchus monoceratus, Schlegel, Urinatores Mus. Pays-Bas, livr. ix, 1867, p. 26. Cites *Sagmathorina* [lege *Sagmatorrhina*] *Lathamii* Bp. and *Cerorhina Suckleyi* Cass. as young.

Phaleris cerorhynca, Bonaparte, Zool. Jour. iii, 1827, p. 53.

Cerorhinca occidentalis, Bonaparte, Syn. Am. Birds, Ann. Lyc. N. Y. iv, 1828, p. 428. Nuttall, Man. ii, p. 538. Vigors, Zool. Voy. Blossom, 1839, Ornith. p. 33.

Ceratorhyncha occidentalis, Bonaparte, Comp. List, 1838, p. 66. Bonaparte, Conspectus. Gav. Comptes Rendus, 1856, xlii, p. 744.

Ceratorhina occidentalis, Audubon, Orn. Biog. 1839, v, p. 104, pl. 402, fig. 5.

Cerorhina occidentalis, Gray, Genera Birds, iii, 1849, p. 639. Heermann, Pac. R. R. Rep. x, 1859, Route to California, Birds, p. 75.

Uria occidentalis, Audubon, B. Am. vii, 1844, p. 364, pl. 471.

* This word is spelled in a great variety of ways, both by Bonaparte himself, and other authors. We find *Cerorhina*, *Cerorrhina*, *Ceratorhina*, *Ceratorrhina*, *Cerorhinca*, *Cerorhynca*, *Cerorhyncha*, *Ceratorhyncha*, *Ceratorrhyncha*, etc. The orthography above cited is that apparently first given by Bonaparte, but is obviously erroneous.

Cerorhina orientalis, Brandt, Bull. Acad. St.-Petersb. ii, 1837, p. 348. By a lapsus calami for "*occidentalis*."

Chimerina cornuta, Eschscholtz, Zool. Atlas, 1829, iii, p. 2, pl. 12.

American and Asiatic coasts and islands of the North Pacific. Japan (Perry's U. S. Expl. Exped.), Kamtschatka (Mus. Acad., Philada.), Pacific coast of N. A. from Russian America to Farralone Islands, Cal. (Mus. Smiths. Inst.) Breeds as far south as Japan and California.

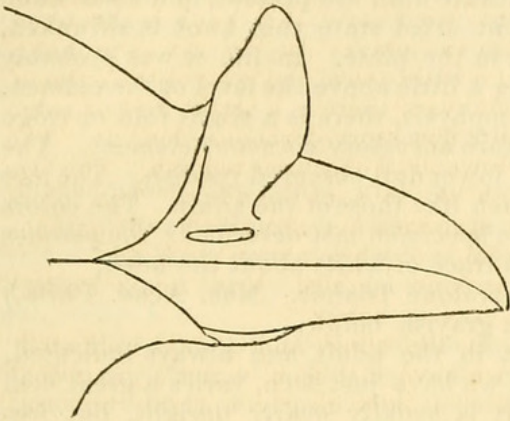


Fig. 1.—*C. monocerata*.
Nat. size. Adult female.

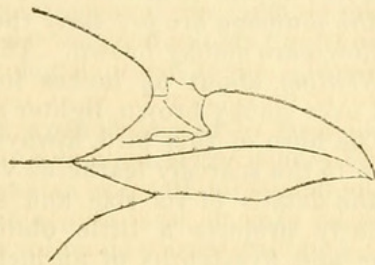


Fig. 2.—*C. monocerata*.
Nat. size. Young scarcely fledged.

Adult, breeding plumage, (No. 46,517, Mus. Smiths. ♀, Sitka, May, 1866).—Bill orange-yellow, culmen and base of upper mandible dusky; horn dull yellowish. Feet apparently dusky yellow; below, with the tarsi posteriorly, blackish; claws black. Crown of head, back of neck, and entire upper parts glossy blue-black. Sides of head and neck, and of body along under the wings to the flanks, with chin, throat and upper part of breast, and under surfaces of wings, clear grayish ash, pretty trenchantly defined along its line of junction with the black. Under parts from the breast pure white; this color shading insensibly into the ashy on the breast and sides. A line of white along the edge of the fore-arm. Exposed portions of wing and tail feathers black; their inner webs greyish-brown, basally lighter, the shafts of the primaries dull whitish at base. A series of elongated, stiffish, acicular feathers on the side of the head from the rictal angle; another similar series from the eye backwards to the sides of the nape, pure white. The individual feathers are about an inch, more or less, in length; the length of the white stripes produced by them collectively is about two inches.

Length 15.50; wing 7.25; tail 2.50; tarsus 1.20; middle toe and claw 1.85, outer do. 1.70, inner do. 1.40; chord of culmen, excluding width of horn, 1.00, including it 1.40; rictus 2.00; gonys, including length of accessory piece, 1.10; height of bill from tip of horn to protuberance at symphysis 1.25; from culmen at base of horn to same .80; nostril to top of horn .75.

Immature, but with a perfectly developed horn, and accessory symphyseal piece (No. 23,391, Mus. Smiths., Straits of Fuca).—Colors somewhat as in the preceding; but the white of the under parts everywhere obscured by ashy-gray, which tinges the tips of the feathers, giving a marbled aspect to the parts, lightest on the middle of the belly, shading insensibly on all sides into the uniform ashy-gray of the other under parts. Black of upper parts, especially on the head, with a decided brownish tinge. Only traces of the acicular white feathers on the sides of the head. Bill smaller than before; the horn, however, perfectly developed, rising nearly half an inch above the culmen. Rather 1868.]

smaller than the preceding; length between 14 and 15 inches, wing barely 7, bill along rictus 1.60, its depth at base, exclusive of height of horn, .65.

Young. (No. 23,392, Mus. Smiths., Straits of Fuca).—This specimen is just not quite fully feathered, patches of down adhering here and there. The bill is small and weak, hardly more than half the size of that of the adult; its general shape, however, is nearly attained. The base of the upper mandible is covered with a soft skin, about as far as the end of the nostrils. That part of the culmen formed by the ridge of this skin is sunken below the level of the rest. Unmistakable indications of the future horn are present, in a small knob on the ridge of this skin. In the present dried state this knob is shrunken, presenting the appearance represented in the plate. In life it was probably a small full rounded protuberance, rising a little above the level of the culmen. Between the mandibular rami, at the symphysis, there is a slight fold or ridge of skin, evidently the matrix of the future accessory corneous element. The upper mandible is mostly blackish; the lower dull obscured reddish. The legs and feet appear to have been colored much like those of the adult. The colors of the plumage are precisely those of the specimen last described; the patches of down are smoky brown. There is no trace of white about the head.

Nestling, about $5\frac{1}{2}$ inches long. (Farralone Islands. Mus. Acad. Phila.) All over smoky brown, lighter and more grayish below.

The horn of this bird, always present in the adult, and always indicated, even in the scarcely feathered young, as we have just seen, varies a great deal in the details of its size and shape. It is usually nearly upright, but frequently projects a little obliquely forward. Its average height is between four and five-tenths of an inch, measuring from the level of the culmen at the anterior edge of the root of the horn. The real roots of the horn begin a little above the nasal aperture; the nostril opening just beneath the lower edge. The horn is thus bifurcated, as it were, at the base, and saddled on the base of the upper mandible. The anterior outline is usually straight, or slightly curved, the apex rounded, and the posterior border irregular in outline. The figure represents what is perhaps an average horn. It would be impossible to indicate all the variation in detail; scarcely two horns are precisely alike.

The frontal feathers ascend a very little way up the back of the horn in the majority of instances; sometimes, however, they end abruptly at its base. From their foremost point they sweep downwards and backwards along the side of the upper mandible with a gentle regular curve, to the rictal angle, leaving the tomial edges of the upper mandible bare. The chin feathers begin at the accessory symphyseal piece, rise quickly on the sides of the under mandible, and reach its tomial edge in advance of the rictal angle.

The symphyseal piece, which is developed from the skin at the apex of the interramal space, is, when fully formed, as hard as the rest of the bill. Anteriorly it is directly continuous with the mandibular symphysis. On its sides, a groove indicates its line of cohesion with the mandibular rami. The horn, when mature, is perfectly corneous and hard to its extreme base; there being no soft skin even about the nostrils. Its main shaft is hollow; a tube is disclosed when the top is worn off or broken off.

The white feathers on the side of the head differ from those of other Phaleridines (except *S. Suckleyi*) in not being very slender, filamentous and wavy. They are straight, short, acutely pointed, stiffish, standing discreet from each other, like so many narrow spear-points.

The very large series of this bird examined warrant the belief that the horn is always present, accidents of course not considered; that it begins to be apparent even before the bird is fully fledged, as a slight knob. That, in like manner, the accessory symphyseal piece is always developed; and that its beginning may be detected at a very early age. These facts must be borne in mind in discussing the unusually interesting points connected with *Sagmatorrhina* as compared with the present genus. The opinion relative to the season-

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al or sexual character of the horn (page 905, Birds of N. A.)* would probably not have been expressed, had the writer enjoyed the opportunity of examining such an extensive series as have been at command in the preparation of the present monograph.

This species was first named *Alca monocerata* by Pallas in 1811. Prince Bonaparte called it "*Phaleris occidentalis*" in 1827; which name has been usually adopted, Pallas' description being overlooked or disregarded. Brandt appears to have accidentally misquoted Bonaparte's name in calling the bird "*Cerorhina orientalis*, Bp." Eschscholtz called it "*Chimerina cornuta*" in 1829. These are the only synonyms which the writer has been able to collate, except, of course, those resulting from the reference of the bird to diverse genera, as has been already noted.

SAGMATORRHINA, Bonaparte.

Sagmatorrhina, Bonaparte, P. Z. S. Lond. 1851, p. 202. Type *S. Latham*, Bp.

"Bill twice as long as high, upper mandible straight at the base, covered with a very large cere, incurved at the tip; lower mandible ascending immediately beyond the middle, forming an obtuse angle; nostrils linear, marginal."—Bp. l. c.

The above is a translation of the diagnosis of a genus framed by Bonaparte for the reception of a bird he calls *S. Latham*. It apparently differs from *Ceratorhyncha* in the contour of the bill, the presence of a soft cere saddled on the base of the upper mandible in the place of a horn, and, it may be presumed, in the absence of the peculiar accessory corneous element at the mandibular symphysis, as no mention is made of such a character. The type and apparently only known specimen is in the British Museum.

The possession of a soft flat cere in place of an upright horn, and the want of the accessory mandibular piece are precisely the features which characterize *Cerorhina Suckleyi* Cassin; and in fact are about the only ones by which the latter can satisfactorily be distinguished, specifically, from *C. monocerata*. It therefore seems a procedure of obvious propriety to refer *Suckleyi* to the present genus. At the same time *Suckleyi* can by no possibility be confounded with *Latham*; nor is the latter by any means a young *C. monocerata*, as some authors have ventured to hint, and others have boldly assumed. An inspection of the figures accompanying the present memoir ought to set all doubts at rest.

Species—(2.)

- "Length 16 inches; wing 7.50; bill 2 long, 1 high, five-eighths wide at the base"..... 1. *Latham*.
Length 14.50; wing 6.50; bill along culmen 1.30, depth at base .60, width at base four-eighths..... 2. *Suckleyi*.

SAGMATORRHINA LATHAMI, Bonaparte.

??? *Alca labradoria*, Gmelin, S. N. i, pt. ii, 1788, p. 550. Very doubtful.

Rather referable to *Fratercula arctica*, which see.

Sagmatorrhina labradoria, Cassin, Baird's B. N. A. 1858, p. 904.

Sagmatorrhina Latham, Bonaparte, P. Z. S. London, 1851, p. 202, pl. 44.

"Largest among its allies; blackish, beneath pallid fuliginous; bill and feet red; cere and webs black. Length 16 inches; bill 2 inches long, 1 inch high, five-eighths wide at the base, three-eighths in the middle; wing 7½ inches; tail 3½; tarsi 1½; longest toe 2 and 3-eighths inches.

Hab.—"North-west Coast of America.

*Spec. No. 10698, there enumerated, seems to have called forth the remark above alluded to. This specimen, however, is believed to be the adult of *S. Suckleyi*, of which only the young bird was at that time recognized.

"This species is the largest of the subfamily, which is well known to contain the dwarfs of the water birds; it is one-third larger than *Ceratorrhina monocerata*, of which it has precisely the coloring, wanting only (at least in the state we have it) the little white feathers above the eye and at the corners of the mouth. The proportions of the wings, tail, feet and toes are the same; the bill and toes must have been reddish; the cere and membranes black. Like the *Ceratorrhina*, it seems to be confined to the north-western Arctic region of America; and we are led to believe it does not extend to the Siberian shores, from the circumstance of its not having been noticed by Russian naturalists."

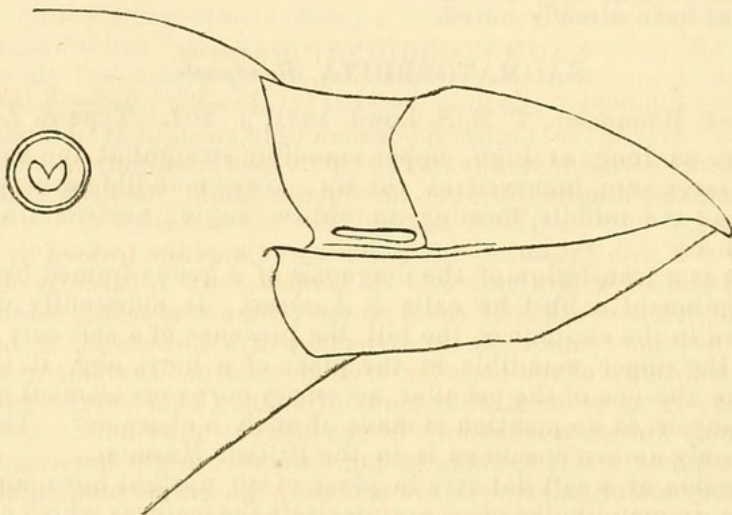


Fig. 3.—*Sagmatorrhina Lathamii*, By. Nat. size.

The preceding is Bonaparte's notice of the species, containing all that is known about it by American ornithologists. The writer takes pleasure in acknowledging his indebtedness to Dr. P. L. Sclater, of London, for the accompanying figure, drawn from the type specimen in the British Museum. Dr. Sclater says very positively that the bird is a perfectly valid genus and species, and the figure evidently warrants the assertion. Independently of the difference between the cere and the horn, the shape of the bills of *C. monocerata* and *S. Lathamii* are quite diverse. The dimensions of the latter are much larger than those of the former.

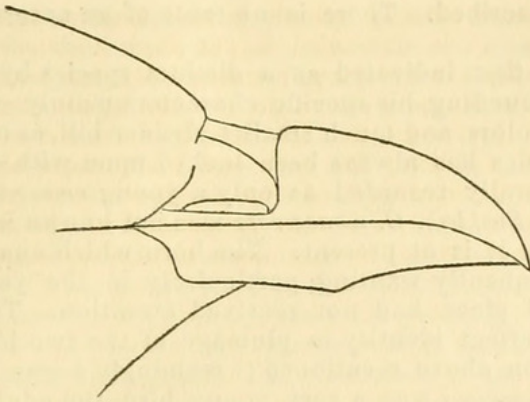
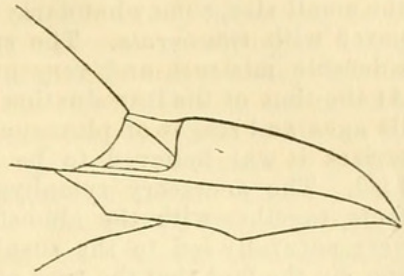
SAGMATORRHINA SUCKLEYI, (*Cass.*) *Coues*.

Cerorhina Suckleyi, Cassin, Baird's B. N. A. 1858, p. 906. Based on spec. No. 4579, Mus. Smiths. Young. Puget Sound. Cooper and Suckley, Pacific R. R. Rep. xii, pt. ii, 1860, p. 284. Refers to same specimen.

American and Asiatic Coasts of the Pacific. Spec. in Mus. Smiths Inst — Young, (type of the species, Puget Sound;) adult, breeding plumage (San Diego, Cal.) Adult, (Hakodadi, Japan.)

Adult! breeding plumage! (No. 31908,* Mus. Smiths, ♀, San Diego, Cal. Feb. 3, 1862, J. G. Cooper.) "Iris white; bill black and orange; feet pale yellow, black below," (label.) Bill now obscure yellow, the culmen and basal membrane blackish. Feet dull whitish; tarsi behind and feet below blackish; claws black. Colors of the plumage almost precisely as in the adult *monocerata*; white feathers on sides of head exactly the same. Breast rather deeper grayish-ash, the color extending a little further, and more abruptly defined against the white of the other under parts.

* Figured in Elliot's Birds of North America.

Fig. 4.—*S. Suckleyi*, Adult. Nat. size.Fig. 5.—*S. Suckleyi*, Juv. Nat. size.
Cassin's type specimen.

No vestige of a horn at base of upper mandible; this being covered with a soft skin, overlapping the culmen, extending to the nostrils, which open beneath its lower border. That part of the bill occupied by the membrane is depressed below the level of the rest, both on the ridge and sides. The membrane is shrunken and shrivelled in its present state. There appears to have been a slight tumidity, in the fresh state, of this membrane, just on the ridge, which may have elevated it to the level of the rest of the culmen, and which could possibly even have been inadvertently called a "knob" by one who regarded it as the beginning of a horn. No trace of an intercalated piece between the mandibular rami, which have thin, sharp, smooth edges, and come together in a fine point at the symphysis. Bill much smaller, weaker, and particularly less deep at the base than that of *C. monocerata*; but not much shorter, nor comparatively even so much compressed as in the latter bird. Culmen regularly decurved from base to tip; the latter moderately overhanging; rictus at first nearly straight, then gently declinate; gonys nearly straight, slightly concave; outline of mandibular rami about straight.

Decidedly smaller than *monocerata*; the wing comparatively longer. Length about 14.00; "extent 25.50," (label); wing 7.25; tarsus 1.10; middle toe and claw 1.90, outer do. 1.80, inner do. 1.45; bill: chord of culmen 1.30, of which the membranous part is .30; rictus 1.85; gonys .75; depth of bill at base .60; its width at same point .45.

Young. (No. 4579, Mus. Smiths. Fort Steilacoom, W. T. Jan. 8, 1856. Dr. G. Suckley. Mr. Cassin's type of the species, as described l. c.) "Membrane at base of upper mandible grayish dusky black; middle of both mandibles dingy orange, their tips dusky; iris pale hazel; under surface of the webs of the feet, and the posterior aspect of the tarsi dusky black; upper surface of the toes bluish white, darker about the articulations; nails black." (Suckley, l. c.) The colors of the plumage are precisely as described for the young *C. monocerata*; possibly a shade darker, with rather more white on the under parts than in the corresponding age of the other species.

Much smaller than the adult; length "about 12.50; extent 24.00;" (Suckley, l. c.): wing 6.50; tail 2.00; tarsi 1.00; bill along culmen 1.20, of which the membranous portion is .30; along rictus 1.60; along gonys .60; its depth at base .40. The bill is small and slender; its general shape calls to mind the bill of a young gull of one of the smaller species. The several outlines, particularly that of the culmen, are straighter than in the adult; the tip is less decurved. The bill is much longer, relatively and absolutely, than that of the corresponding age of *monocerata*; it is comparatively more slender. There is no trace of a knob;* the membrane has precisely the same characteristics as

* Dr. Suckley (l. c.), speaking of this specimen, uses the word "knob" in connection with it. His expression is to be taken as indicating merely the turgidity of the soft membrane during the life of the bird; which raises the membrane to or above the level of the rest of the culmen. The membrane, being very soft, shrinks and shrivels in drying, and the prominence disappears.

that of the adult bird above described. There is no trace of an accessory piece between the rami.

The bird above described was first indicated as a distinct species by Mr. Cassin in 1858; that gentleman founding his specific characters mainly upon the small size, somewhat darker colors, and much smaller, slender bill, as compared with *monocerata*. The species has always been looked upon with considerable mistrust, and very generally regarded as only a young *monocerata*. At the time of the introduction of *Suckleyi*, *C. monocerata* was not known in all its ages and stages of plumage, as it is at present. The horn which characterizes it was believed to be frequently wanting, particularly in the young bird. The accessory symphyseal piece had not received attention. These facts, together with the almost perfect identity in plumage of the two birds, very naturally led to the suspicion above mentioned; seemingly borne out, too, by the fact that the type of *Suckleyi* was a very young bird, the adult of which was unknown, or at least unrecognized. But it has been shown in the preceding article that indications both of the horn and of the accessory interramal element appear in *monocerata* even before it is fully feathered, and that these two distinguishing features are preserved in all ages, at all seasons, with both sexes. The discovery of *Suckleyi* in perfectly adult breeding plumage settles the question of its identity with *monocerata*. Specimen No. 31,908, above described, has no trace of a horn or accessory symphyseal piece; and is smaller, and otherwise conspicuously different from *monocerata*, though of almost precisely similar colors of plumage.

There is something highly interesting, very singular, and, with our present information upon the subject, totally inexplicable, in the fact that the plumage of the two birds is so nearly identical as not to be satisfactorily distinguished in any particular; while the bills differ in such radical characteristics. The suspicion comes unbidden, that the whole truth in the matter of *C. monocerata*, and *S. Suckleyi*—and *S. Lathamii*, too—remains to be developed; while it is certain, at the same time, that nothing but the truth appears upon these pages.

In the reference of this species to the genus *Sagmatorrhina*, the writer is guided simply by Bonaparte's diagnosis, and by the figure of the head of *S. Lathamii*, kindly furnished by Dr. Sclater. The dimensions of *S. Lathamii* and the form of the bird are sufficient to distinguish *S. Suckleyi* from it.

SIMORHYNCHUS, Merrem.

Alca, Pallas, Spic. Zool. v, 1769, in part; and of some authors.

Uria, Pallas, Zoog. R.-A. ii, 1811, in part.

Lunda, Pallas, Zoog. R.-A. ii, 1811, in part.

Simorhynchus, Merrem, ———, 1819. Type *Alca cristatella*, Pall. Fide G. R. Gray. (Where is this genus named?)

Phaleris, Temminck, Man. Orn. ii, 1820. Type *Alca psittacula*, Pallas. (Also includes *cristatella*.) And of most authors.

Mormon, Lichtenstein, 1823, in part. (*M. superciliosa* = *camtschatica*, Lep.)

Ombria, Eschscholtz, Zool. Atlas, 1831. Type *Alca psittacula*, Pallas.

Cyclorrhynchus, Kaup, 1829. Type *Alca psittacula*, Pall. Fide G. R. Gray.

Tylorhamphus, Brandt, Bull. Acad. Imper. St. Petersburg, ii, 1837. Type *Alca cristatella*, Pall.

Ciceronia, Reichenbach, 1853. Type *Phaleris microceros*, Brandt.

Of moderate and very small size; general form stout. Usually with a crest, or with elongated feathers about the head. Bill variable: sometimes simple, oftener irregular in form, with various elevations and depressions, often with nodules or other accessory elements; always stout, compressed, shorter than the head, the culmen very convex, the tip acute. Nostrils entirely unfeathered. Wings and tail of the ordinary shape and length. Feet small and short; tarsus compressed, entirely reticulate, shorter than the middle toe. Toes long, outer and middle about equal in length, the claw of the latter largest. Claw

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of inner toe reaching base of middle one. Claws much arched, compressed, acute, the inner edge of the middle one scarcely dilated.

The genus as above defined is framed to include a number of species, all more or less closely allied, yet presenting differences from each other in form in almost each instance. The various species are all nearly identical in the structure of the wings, feet and tail; in the bill no two entirely agree. Each presents *suæ speciei* characters in the shape of the bill; but the very fact that this organ varies so much seems to indicate that the differences are no more than of specific consequence. A glance at the synonyms above adduced will show what forms have been made indicative of genera. *Psittacula* is perhaps the species which has been most generally separated from the others, in view of its oval upper, and falcate under, mandible. But if this bird is to be generically distinguished, so also must *crisatellus*; for the latter differs in still greater degree, in the presence of an anomalous accessory element in the bill. This one being taken out, what to do with *camtschaticus*, so very closely allied? It is almost identical with *crisatellus* in all points of structure, except in the details of the configuration of the bill, and in these points it stands intermediate between this species and some others. Then *microceros* and *pusillus* would have to stand by themselves. So also would *tetraculus* and *Cassini*. These two, particularly, differ more from all the rest, in their short, simple conic bills, than any of the rest do from each other. In fine, if *psittacula* be allowed generic rank, so also must *crisatellus*, and *pari passu* must no less than three more genera be recognized. It seems much the most philosophical to group all these forms together in a single genus, regarding the differences in the bills as specific.

In such an acceptance, the genus comprises eight species, which may be thus analysed:

Species—(8.)

- I. *Phaleris* Temm. Upper mandible oval, under mandible falcate; rictus curved upwards. No crest.
Blackish; white below from the breast; a white spot below the eye..... 1. *psittaculus*.
- II. *Simorhynchus*, Merrem. Upper mandible triangular, under mandible nearly straight; rictus horizontal, sinuate. A long recurved crest.
Angle of the mouth with a supernumerary corneous piece. Sides of under mandible unfeathered. One series of white feathers on the head 2. *crisatellus*.
Unknown. (See Pallas' description, *infra*)..... 3. *dubius*.
Angle of mouth without a supernumerary piece.
Sides of under mandible feathered. Three series of white feathers on head... 4. *camtschaticus*.
- III. (*Unnamed subgenus*.) Bill very small, short, conic, simple, destitute of any irregularities whatever.
Large; bill moderately compressed; a long recurved crest; fuliginous black above, fuliginous gray below. Wing 5.50; rictus .70; width of bill at base .30; tarsus, middle toe and claw together 2.50..... 5. *tetraculus*.
Small; bill excessively compressed; no crest (?); uniform plumbeous, lighter below, whitish on the abdomen. Wing 4.25; rictus .60; width of bill at base .15! Tarsus, middle toe and claw together, 2.00..... 6. *Cassini*, n. s.
- IV. (*Ciceronia*, Reich.) Smallest of the genus. Short white hair-like feathers over the forehead.

- Length about 6.50; height of bill at base .30. Upper mandible with a basal knob; bill stout and wide for its length. No decided white patch on scapulars 7. *microceros*.
 Length about 5.50; height of bill at base .20. Upper mandible without a knob; bill slender and narrow for its length. Conspicuous white patch on scapulars 8. *pusillus*.

The first distinctive name of this genus is said, by Mr. Gray, to be *Simorhynchus* of Merrem, with *cristatellus* as type. This genus is not in general employ. The present writer does not know where it is instituted, but adopts it upon the authority just mentioned. *Phaleris* of Temminck is usually adopted. This genus was framed, in 1820, to include both *psittaculus* and *cristatellus*: the characters as laid down apply best to the latter; the former is mentioned first. It cannot be used for *cristatellus*, however, being antedated by Merrem's name. If *psittaculus* is separated from the present genus, it must be called *Phaleris*, Temm., which antedates *Ombria* Esch., though the latter is usually applied to that bird. *Tylorhamphus* Brandt is simply a duplication of Merrem's genus; *Cyclorhynchus* Kaup merely repeats Temminck's. *Ciceronia* Reichenbach is based upon the smallest species of the genus—section four in the preceding analysis. Section three of the foregoing synopsis, comprehending *tetraculus* and *Cassini*, is really the most distinct of any, and is the best entitled to generic rank. The chance to run in a name is left open to any one who may be ambitious in that line.

SIMORHYNCHUS PSITTACULUS, (Pall.) Schl.

- Alca psittacula*, Pallas, Spic. Zool. v, 1769, p. 13, pl. 2, and pl. 5, figs. 4, 5, 6. Gmelin, S. N. i, pt. ii, 1788, p. 553. (Based on Pallas and Pennant.) Latham, Ind. Orn. ii, 1790, p. 794. (Same basis.) Donndorff, Beytr. Zool. ii, pt. i, 1794, p. 822. Quotes Steller, Nov. Act. Petrop. iv, p. 426, pl. 13, figs. 25, 26; and other authorities.
Lunda psittacula, Pallas, Zoog. R.-A. ii, 1811, p. 366, pl. 84.
Phaleris psittacula, Temminck, Man. Orn. i, 1820, p. 112. Stephens, Shaw's Gen. Zool. xiii, 1825, p. 44. Bonaparte, Synopsis, 1828, p. 426. Gray, Genera Birds, iii, 1849, p. 638. Bonaparte, Comptes Rendus, 1856, xlii, p. 774.
Ombria psittacula, Eschscholtz, Zool. Atlas, 1831, iv, p. 3, pl. 17. Brandt, Bull. Acad. St. Petersb. ii, 1837, p. 348. Cassin, Baird's B. N. A. 1858, p. 910. Elliot, B. N. Am. 1866, part i.
Simorhynchus psittaculus, Schlegel, Urinatores Mus. Pays-Bas, 1867, livr. ix, p. 24.

Asiatic and American coasts of the North Pacific; Aleutian Islands; Kamtschatka, (Mus. Acad. Philada.); Russian America, (Mus. Smiths. Institution); Behring's Sea, (Schlegel, Mus. Pays-Bas.); Japan?

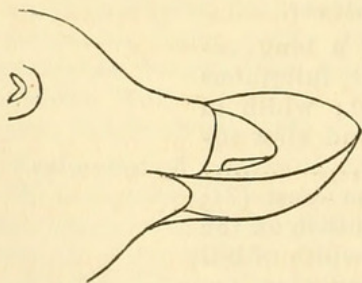


Fig. 6.—*Simorhynchus psittaculus* (Pall.)
 Nat. size.

Bill moderately large, much compressed, densely feathered for some distance at base of upper mandible and sides of lower. Upper mandible almost perfectly oval in its lateral aspect, its culmen gently curved, and its tomial edges more decidedly convex, the former descending, the latter rapidly ascending to meet at an obtuse angle. Lower mandible extremely slender, falciform in shape, strongly curved upwards, its tip very acute, its tomial edges concave, corresponding to the convex tomia of the upper mandible; the gonys much and regularly curved. Nasal fossæ long and wide, but rather shallow; the nares rather broadly linear, or narrowly oval, overhung by a slightly projecting scale. Frontal feathers embracing culmen

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in a slightly reëntrant angle, thence descending about perpendicularly to the very edge of the upper mandible. Feathers on side of lower mandible not extending quite so far as those on side of upper. Interramal space fully feathered, but in consequence of the peculiar shape of the rami, there is a small pit or fossa between them, just at their junction, which is unfeathered. Wings and tail of the usual length and shape; the length of the latter contained about three and two-thirds times in the length of the former from the carpal joint to the end of the longest feather. Tarsus shorter than the middle toe without its claw.

Adult—Without a crest. A series of elongated very slender filamentous white feathers from the eye backwards and downwards, white. Entire upper parts, with chin, throat, breast, and flanks, fuliginous or brownish-black, lighter or grayer below than above; other under parts pure white, pretty trenchantly defined against the darker color of the breast. Bill orange or coral red, becoming enamel yellow at the tip, and along the cutting edges. Legs and feet dull greenish, darker posteriorly, (in the dried state.)

The above is the state of plumage of apparently most mature birds; but is much more rarely met with than the succeeding: Upper parts as just described, but no whitish feathers below and behind eye. Entire under parts white, marbled on the throat, breast and sides with dusky or blackish; this color usually occupying chiefly or wholly the tips of the feathers, whose bases are white. The mottling is thickest on the breast, most sparse on the abdomen; but it varies in degree with almost every specimen. A state of plumage is described as that of the young, in which the white occupies nearly the whole under parts, and is scarcely mixed with dusky, even on the throat and breast. This stage is not represented in American Museums. The tendency of the mottling, as the bird grows older, seems to be to increase on the throat, breast, perhaps on the sides and flanks, and to disappear from the other under parts, leaving the latter pure white, in marked contrast. The under wing coverts are always dark ashy brown; the short tibial feathers the same.

Length about 9·00; wing 5·40 to 5·75; tail 1·50 to 1·60; tarsus (average) 1·00; middle toe 1·10. Bill: chord of culmen ·60, chord of gonys just about the same; depth opposite posterior end of nostrils ·45; width at same point ·30; rictus nearly or about 1·00.

This very curious species may be instantly recognized, in whatever state of plumage, by the remarkable configuration of the bill; the rictus being strongly curved upwards, the upper mandible oval, obtuse, the lower falci-form, acute. It is one of the longest and best known of the North Pacific representatives of the family, and is apparently a very common bird, though specimens do not occur in collections so often as might be expected. It seems to be decidedly boreal in habitat, and is not recorded, on the American coast, so far south as the United States, though occurring at Sitka, R. A., and probably off the coast of British Colombia. It has no specific synonyms, though it has been referred to several different genera. It is one of Dr. Pallas' species. It is the type of M. Temminck's genus *Phaleris*.

SIMORHYNCHUS CRISTATELLUS, (*Pall.*) *Merrem*.

Alca cristatella, Pallas, Spic. Zool. v, 1769, p. 20, pl. 3, and pl. 5, figs. 7, 8, 9. Gmelin, S. N. i, pt. ii, 1788, p. 552, No. 7. Latham, Ind. Orn. ii, 1790, p. 794, No. 6. Donndorff, Beytr. Zool. ii, pt. i, 1794, p. 821. Vieillot, Gal. Ois. ii, 1825, p. 242, pl. 297.

Uria cristatella, Pallas, Zoog. R.-A. ii, 1811, p. 370, pl. 86. Erroneously cites as synonymous *Alca camtschatica*, Lepechin.

Simorhynchus cristatellus, Merrem., Bonaparte, Tab. Comp. Pelag. Comptes Rendus, xlii, 1856, p. 774. Schlegel, Urinatores Mus. Pays-Bas, livr. ix, 1867, p. 25. (Considers *U. dubia* and *tetracula* Pall., young of this species.)

Phaleris cristatellus, Stephens, Shaw's Gen. Zool. xiii, 1825, p. 47, pl. 5. Not 1868.]

of Temminck, Pl. Color. 200, which is *Alca camtschatica* Lepechin. Bonaparte, Synopsis, 1828, p. 426.—Id. Compt. and Geog. List. 1838, p. 66. Vigors, Zool. Voy. Bloss., 1839, Orn. p. 33. Gray, Gen. B., iii. 1849, p. 638. *Phaleris (Simorhynchus) cristatella*, Cassin, Baird's B. N. A. 1858, p. 906. *Tylorhamphus cristatellus*, Brandt, Bull. Acad. St. Petersb. ii, 1867, p. 348. *Phaleris superciliata*, Audubon, Orn. Biog. pl. 402; oct. ed. pl. 437. Not *Mormon superciliosa* Licht., nor *Phaleris superciliosa* Bonap., which refer to *Alca camtschatica* Lepechin.

Asiatic and American coasts and islands of the North Pacific, to Behring's Straits; perhaps into the Arctic Ocean. Kamtschatka and Behring's Straits, (Mus. Acad. Phila.) Japan, and north-west coast of America, (Mus. Smiths. Inst.) Not known to occur on the American coast so far south as Washington Territory, U. S.

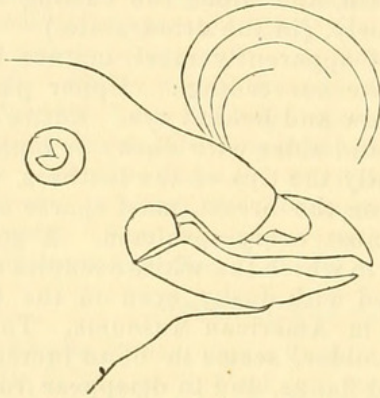


Fig. 7.—*Simorhynchus cristatellus*, (Pallas.)
Nat. size.

from base to tip, which latter is rather acute, and slightly overhangs the lower mandible; its tomial edge extremely sinuate and irregular, lightly notched just behind the tip, at the base widened and somewhat everted, for the reception of the cutting edge of the lower mandible; lower mandible not nearly so deep as the upper, somewhat ascending towards the tip, which latter is slender and acute; the gonys short, perfectly straight, moderately ascending, the sides of the lower mandible elongated, everted, their tomial edge elevated and dilated at the base, posteriorly corresponding in contour to the antero-inferior outline of the supernumerary piece. The latter is a sub-circular or subquadrate corneous plate, slightly concavo-convex, wedged in between the bases of the tomial edges of the two mandibles, and forming the angle of the rictus; in color and texture it resembles the rest of the bill, of which it is a true component element. Nasal fossæ small and inconspicuous, not deeply furrowed, filled in by corneous substance like the rest of the upper mandible; the nostrils small, short, linear-oblong, placed close by the tomial edge of the mandible, overhung by an arched and much dilated corneous scale. Feathers extending on culmen to a point opposite the angle of the gonys, thence descending perpendicularly along the sides of the bill, just past but not touching the posterior extremity of the nostrils; thence following the sinuosities of the commissural edge of the upper mandible to the supernumerary piece, and around the border of the latter,* but not encroaching upon it. Interramal space of lower mandible densely feathered; but no feathers encroach upon the sides of the lower mandible, contrary to the usual rule in this group.

* This supernumerary corneous element is not attached by its whole surface to the sub-cumbent bone; but a part of its upper border is free and projects a little away from the skull. The fossa down behind this free raised border is fully feathered.

Wings and tail of the usual shape and structure of this group; the length of the latter contained three and a half times in the length of the former from the carpal joint to the end of the longest primary. Legs short, stout, little compressed. Tarsus entirely reticulate, shorter than middle toe without claw; outer toe as long as the middle one; its claw shorter and smaller than that of the middle one. Inner lateral toe extremely short, the tip of its claw falling far short of the base of the middle claw.

Adult.—An elongated crest of twelve to twenty slender feathers springing in a bundle from one point at the extreme forehead, far in advance of the angle of the rictus, and curving over forwards in the greater part of a circle. These feathers are not truly filamentous, having well developed, though short barbs, and appear narrower than they really are, from the slight obliquity of the barbs from the shaft. A slender bundle of filamentous feathers from the posterior canthus of the eye over the auriculars and sides of the neck. A very few shorter filamentous feathers forming a sparse interrupted superciliary series. All these filamentous feathers white or whitish; the crest concolor with the plumage of the upper parts. General color of the crown, nape, wing, tail, and whole upper parts glossy blackish, with a good deal of a fuliginous or brownish (not plumbeous or cinerous) tint; under parts a diluted shade of the same, or much more brownish gray, tending on the abdomen and posterior under parts generally to ashy gray. Under surfaces of wings and tail like abdomen. Bill and appendages orange or vermillion red, yellowish towards the tip. Feet dusky greenish, an undefinable color, in the dried state.

Length about 9.00; wing 5.25; tail 1.50; tarsus 9.00; middle toe and claw 1.35; outer toe and claw about the same, or slightly less; inner toe and claw 1.00; bill: chord of culmen .45; tomia of upper mandible, excluding supernumerary piece .70; greatest width of the latter .25; tomia of under mandible .90; gonys .40; depth of bill opposite posterior end of nares .45; width at same point .35.

Young.—Similar to the adult, except in the following points:—The bill is smaller, weaker, less irregular and sinuous in outline, less brightly colored, wanting the expansion and eversion of the tomial edges of the two mandibles near their base, and with little or no trace of the supernumerary piece at the angle of the mouth. Even in the youngest specimens the bill shows unmistakable signs of its future character, and cannot be confounded with the simple conic bill of *tetraculus*, etc. The crest and white setaceous feathers are wanting, or only traces of them are apparent. The color is less blackish, more inclining to a fuliginous dusky above, and to a light dull brownish gray below.

This species never acquires a distinct parti-coloration like that of most species of the genus. With the exception of the whitish filamentous feathers on the head, the colors are uniform over the whole body, varying in shade on different parts; and the transition from the darkest, that of the upper parts, to the palest on the lower is effected by imperceptible degrees. The brilliantly colored bill is a conspicuous feature. The color of the feet cannot be accurately defined in the dried state; but the tints are probably not very striking. The crest only makes its appearance after the bird is full grown, is at least nearly a year old, and has acquired pretty much the perfect shape of the bill. The same is true of the white supra- and post-ocular filaments; and generally among the Phaleridine birds, the presence of these peculiar head-ornaments may be relied on as indices that the bird is adult, and that its bill has acquired its mature form. It is just possible, however, that these remarks may not apply to the setaceous frontal feathers of *S. microceros* and *pusillus*. The crest of *S. cristatellus* first appears as a little bundle of short straight feathers shooting out backwards from the plumage of the forehead. These plumes, in an early state of their growth, are much broader,

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that is, with more distinct barbs or fibrillæ, than subsequently; considerable time elapses before they begin to curl over forwards, and they may continue straight until they are an inch or rather more in length. When full grown, they are high unto two inches long, curve until they almost make a circle, drooping gracefully, helmet-wise, upon the bill itself. The crest of this and other species is doubtless moved by peculiar muscles, and entirely subject to the control of its wearer, like the very similar crests of the birds of the genus *Lophortyx*.

Simorhynchus camtschaticus is obviously the species most likely to be confounded with the present. In fact, such has been its fate at its hands of so distinguished an ornithologist as M. Temminck. It would be wasting words to institute a comparison between the adults of the two species at this late day. In the youthful condition, before the distinctive head-ornaments are apparent, and even before the bill has attained its perfect form, so characteristic in each case, the two species may be distinguished with equal facility. In *camtschatica*, the basal moiety of the sides of the lower mandible is always feathered; in *crisatellus* this part of the bill is in its whole length always perfectly bare of feathers. This latter feature is, in fact, the most excellent diagnostic character of *crisatellus*; by the aid of which alone the species may always be recognized, be it in never so immature condition, with never so undeveloped a bill. The relationships of this species to *dubius* and *tetraculus* need not be noticed here, as they are given in all necessary detail under the head of these species respectively.

This species was introduced into the records in 1769, by Dr. Pallas, who fortunately gave it a binomial name, thereby securing it from appropriation by Gmelin, who contrived to filch so many species from Pennant, Latham, and other contemporaneous writers. Dr. Pallas first described it as an *Alca*, but afterwards removed it to the genus *Uria*—a very unwarrantable procedure. It is the type of Merrem's genus *Simorhynchus*, and of Brandt's genus *Tylorhamphus*; but not, as generally supposed, of Temminck's genus *Phaleris*, which is based upon *Alca psittacula* Pall. Though thus referred to so many different genera, it has hardly a specific synonym, unless the name on Audubon's plate 402 be regarded as such.

Numerous excellent specimens of this bird are in the collections of the Philadelphia Academy and of the Smithsonian Institution, from the various localities quoted at the head of this article. It is decidedly a boreal species, not recorded from the coast of the United States, though occurring on the Asiatic shores as far south, at least, as Japan.

SIMORHYNCHUS DUBIUS, (Pallas) Coues.

Uria dubia, Pallas, Zoog. R.-A. ii, 1811, p. 371, pl. 87. "U. rostro fusco simplici, crista frontis pennacea recurva, * * sexu vel ætate tantum a præcedente [*crisatella*] videtur deferre, licet deficientes ad oris angulos calli carnei, et rostrum minus hiulcum differentiam insignem constituent. Cum præcedenti in mari extra Awatscham portum observatur. Irides candidæ. Rostrum sanguineo-fuscum. Pedes coerulescentes. Cæterum *A. crisatellæ* magnitudine et colore simillima."

Phaleris dubia, Brandt, Bull. Acad. St. Petersb. ii, 1837, p. 347. Gray, Gen. Birds, iii, 1849, p. 638.

Tylorhamphus dubius, Bonaparte, Tab. Comp. Pelag. Comptes Rendus, 1856, xlii, p. 774.

This species, if it be really such, appears appropriately named, since there is nothing to distinguish it from *crisatellus* beyond certain differences in the bill which might with propriety be attributed to an immature condition of the specimen upon which the species was based. And yet the mention of a recurved crest of feathers upon the forehead by Dr. Pallas militates against the supposition that his specimen was not adult. The great reliability which the scientific writings of Dr. Pallas claim, and justly deserve, from their

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uniform excellence and accuracy, necessitates no small degree of caution in a decision against the validity of one of his species. It will be evident upon the least reflection that, for example, such a perfectly valid species as *tetraculus*, might be so described, in a few sentences, that no striking impression of its difference from *cristatellus* should be conveyed. It is also to be borne in mind that Prof. Brandt, probably unsurpassed by any one in the accuracy and extent of his knowledge of the *Alcidæ*, and particularly well fitted to judge of Dr. Pallas' works, admits the species in question as distinct. And in the present instance it seems preferable to coincide with the views of these naturalists, and to allow the species to hereafter stand upon its own merits, until the proof that it has none is forthcoming, notwithstanding Dr. H. Schlegel's summary assignment of it (as well as of *tetraculus*) to *cristatellus*.

There is no specimen purporting to represent this species in any American Museum; and the only information regarding it which can be furnished at present writing is embodied in the above citation from the "Zoographia." It is hardly, if at all, noticed by other writers than those here cited. Mr. Cassin, however, queries it as a synonym of *cristatellus*.

SIMORHYNCHUS CAMTSCHATICUS, (Lepech.) Schl.

Alca kamtschatica, Lepechin, Nova Acta Petrop. xii, 1801, p. 369, pl. 8.

Phaleris camtschatica, Brandt, Bull. Acad. St. Petersb. ii, 1837, p. 347. Gray, Gen. Birds, iii, 1849, p. 638. Cassin, Baird's B. N. A. 1858, p. 908.

Tylorhamphus camtschaticus, Bonaparte, Tab. Comp. Pelag. Comptes Rendus, 1856, xlii, p. 774.

Simorhynchus camtschaticus, Schlegel, Urin. Mus. Pays-Bas, 1867. livr. ix, p. 25.

Uria mystacea, Pallas, Zoog. R.-A. ii, 1811, p. 372, pl. 89. Quotes *Alca camtschatica* Lepechin, having just previously cited it for *cristatella*.

Phaleris cristatella, Temminck, Pl. Color. No. 200. Not of authors.

Mormon superciliosum, Lichtenstein, Verzeich. 1823, p. 89.

Phaleris superciliosa, Bonaparte, Comp. and Geog. List, 1838, p. 66.

North Pacific Coasts. Unalashka, (Pallas.) Kamtschatka, (Mus. Bost. Nat. Hist. Soc.) North-west coast of America, (Mus. Smiths. Inst.)

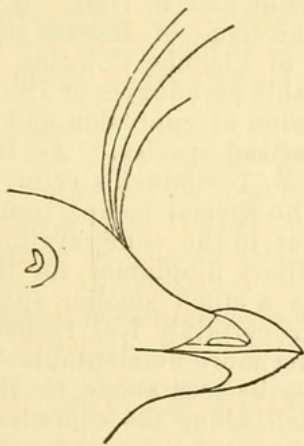


Fig. 8.—*Simorhynchus camtschaticus*, (Lep.) Nat. size.

Bill much smaller, simpler, and differently shaped from that of *S. cristatellus*, though not distantly resembling the juvenile undeveloped condition of the latter. Width at nostril very slightly less than depth at same point, about two-thirds of the length of culmen; bill regularly > shaped in lateral outline; culmen very convex, regularly arched from base to tip; gonys nearly straight, rapidly ascending; commissure slightly sinuate, a little curved upward at tip; apices of both mandibles acute, fairly meeting each other on the level of the commissure; tomia of upper mandible slightly nicked near the tip of the bill. Wings and tail of usual shape for this genus; the length of the latter contained about three and a half times in the length of the former from the carpal angle to end of first primary. Tarsus much shorter than middle toe and claw; middle toe a little shorter than outer toe; middle toe and claw just as long as outer toe and claw; inner toe and claw a little shorter than middle toe without its claw.

The form of the bill alone is characteristic; the other details of structure are shared by the rest of the *Simorhynchi*.

A very long recurved crest of exceedingly slender, delicate, filoplumaceous 1868.]

feathers, six (to ten?) in number, springing from the anterior part of the forehead, about opposite the anterior edge of the orbits, brownish-black; a single series of slender filamentous feathers from each side of the base of the culmen, and thence to the superior border of the orbit; a second similar but shorter series from the edge of the commissure, and thence along the lower part of the side of the jaw; a third similar series from the posterior canthus of the eye, and thence adown the side of the neck; yellowish white. Body colors almost uniform; brownish black, sometimes with more of a grayish, sometimes with more of a fuliginous hue; the wings and tail most intense in color, frequently nearly black; the under parts, particularly the belly, lighter and more grayish brown, inclining to mouse color. Bill orange red, its apex salmon color, or more decidedly yellowish. Legs (in the dried specimen) posteriorly dark brown, anteriorly lighter, more reddish-brown; feet dull brown; claws reddish-brown.

Length of body (approximately) 8.00 inches; wing 5.60; tail 1.60; bill: chord of culmen .45; depth at base .28, width at base nearly the same; length of rictus .95; tarsus 1.00; middle toe 1.25, its claw .35; outer toe 1.30, its claw .30; inner toe and claw 1.10; length of outstretched crest 1.40; length of longest whitish feathers over eye 1.00.

Os hyoides examined: The apophyses are slender cylindrical bones .6 long, slightly knobbed at the end, devaricating at an angle of about 40°. The ceratohyals are absent in the specimen. The urohyal is a delicate style for .10 of an inch, then suddenly expands into a broad, flat, very thin spatulous lamina, subrectangular in shape, or rather cordate, transversely concavo-convex. This lamina is as long as the rest of the urohyal, and its breadth is rather greater than the length of the stylous portion. The basi-hyal is .15 of an inch long, slender and cylindrical; bearing upon its apex an exceedingly thin, expanded, somewhat cochleariform glosso-hyal. No opportunity has presented itself of examining the tongue bones of other species of the family.

The present is a long and well known species. First made known, at the beginning of the present century, by Lepechin, (see above) it was redescribed as *Uria mystacea*, in the Zoographia Rosso-Asiatica, by Dr. Pallas, whose expression " * * pennulis setaceis albis elongatis superciliaribus mystaceisque," leaves no room for doubt as to the species he had in view. It was redescribed in 1823 by Prof. Lichtenstein, under the name of *Mormon superciliosum*. Unfortunately, it furnished the subject of Planche Coloriée, No. 200, at the hands of M. Temminck, under the palpable pseudonym of *Phaleris cristatella*; which event might have been the occasion of confusion and uncertainty, were the bird a less strongly characterized species. As it is, there is no difficulty in detecting and correcting M. Temminck's error. *S. camtschatica* is so very distinct from *cristatella*, that no special comparisons of the two are required. It is only necessary to point to the configuration of the bill, and the presence of superciliary and maxillary filoplumes, for their ready discrimination. For the rest, the present is a much smaller species than *cristatellus*; and the plume is perhaps longer, certainly less recurved, usually composed of fewer feathers, which are rather more filamentous. The setaceous feathers are essentially arranged, as may be seen above, in three distinct sets or bundles; one from the side of the bill along the commissure and lower part of the cheeks; one from the culmen over the eye, and a third from the posterior canthus of the eye backwards over the auricular region and side of the neck; though the first and last sets may appear more or less directly continuous with each other. It is possible that the plumage described above may not be the most perfect one; still, the perfect development of the crest and other ornaments warrants the belief that the bird from which it was taken is an adult. Authors speak of the under parts, particularly the abdomen, as being frequently nearly white; which may be the coloration of those parts in very mature or very old birds.

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At present writing only one perfect specimen of this species is known to exist in any American Museum. The Boston Natural History Society possess this one; No. 9209 of the Museum Register, No. 8135 of the Fresnaye collection, now owned by the Society. The Smithsonian Institution has a mutilated specimen, (ah ead only), from the north-west coast of America, presented by Mr. John Gould. As far as can be judged, it belongs to a bird rather more perfectly plumaged than the Boston Society's specimen.

SIMORHYNCHUS TETRACULUS, (Pall.) Coues.

Alca tetracula, Pallas, Spic. Zool. v, 1769, p. 23, pl. 4, and pl. 5, figs. 10, 11, 12. Gmelin, S. N. i, pt. ii, 1788, p. 552, No. 8. Quotes Dusky Auk, Pennant, Arct. Zool. ii, p. 515, No. 435. Latham, Ind. Orn. ii, 1790, p. 794, No. 7. Quotes Pallas, Spic. Zool. Donndorff, Beytr. Zool. ii, pt. i, 1794, p. 821.

Uria tetracula, Pallas, Zoog. R.-A. ii, 1811, p. 371, pl. 88.

Phaleris tetracula, Stephens, Shaw's Gen. Zool. xiii, 1825, p. 46. Brandt, Bull. Acad. St. Petersburg, ii, 1837, p. 347. Gray, Genera Birds, iii, 1849, p. 638. Elliot, B. N. A. 1867, part iii.

Tylorhamphus tetraculus, Bonaparte, Tabl. Comp. Pelag. Comptes Rendus, 1856, xlii, p. 774. Erroneous assignment of Brandt's genus *Tylorhamphus*, which is based upon *cristatellus*.

Phaleris (Tylorhamphus) tetracula, Cassin, Baird's B. N. A. 1858, p. 907.

Asiatic (and American?) coasts of the North Pacific. "In mari orientali, præsertim Unalashka," (Pallas.) Kamtschatka, (Mus. Acad., Philada., and Mus. Smiths. Inst.) Bay of Yedo, Japan, (Mus. Smiths. Inst.)

Bill small, short, much compressed, regularly conical from a lateral view, simple, being without decided sulci, ridges, caruncles or other irregularities of surface of any sort; culmen narrow, regularly moderately convex from base to tip; commissure and gonys perfectly straight in their whole length; the tip of the bill turned neither up nor down, but the points of both mandibles almost meeting on the level of the commissure. Nasal fossæ scarcely discernible as such, the upper border of the small, basal, linear nostrils being flush with the rest of the bill. Frontal feathers extend

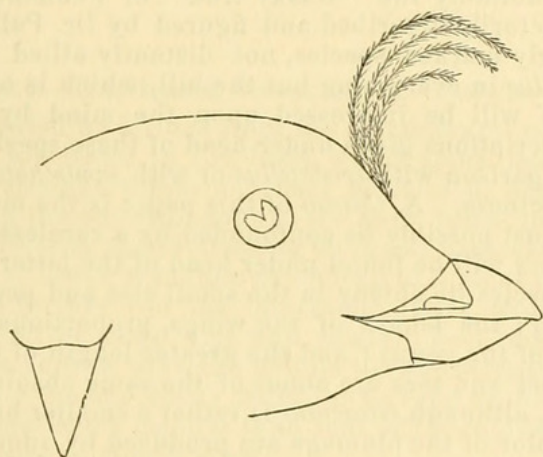


Fig. 9.—*Simorhynchus tetraculus* (Pall.) Nat. size.

forward with an obtusely rounded outline on the culmen, then rapidly recede backwards as they pass downward in a straight line just past the posterior end of the nostrils to the commissural edge of the upper mandible; those on the side of the lower mandible extending not quite so far, but the interramal space fully feathered. Wings rather longer than usual in this group; legs, feet, and tail as in other species of the genus, the legs perhaps a little longer, comparatively, than in other species. A crest of ten or more slender elongated feathers with loosened fibrillæ springs from the middle of the forehead, just before the eyes, and curves forward in the greater part of a circle to near the tip of the bill. A very few filamentous feathers on the sides of the head, the slender series beginning at the posterior canthus, and thence extending downwards and backwards. A small white spot just below the eye. Everywhere dull blackish, or dusky; deepest on the back, becoming more of a smoky or brownish-gray 1868.

on the under parts; under wing coverts like the rest of the under parts; crest colored like the back. Bill an undefinable dusky* in the dried specimen; legs and feet livid gray, (probably greenish or bluish in life); membranes black; claws black.

Dimensions.—(Spec. in Mus. Acad., Phila.) Length about 8.50; wing 5.50; tail 1.60; chord of culmen .35; gape .60; gonys .25; greatest height of bill .33, greatest width .25; tarsus 1.00; middle toe and claw 1.50, outer 1.40, inner 1.25.

Another specimen, (No. 22,258, Mus. Smiths. Inst.) Wing 5.60; tail 1.75; chord of culmen .40; gape .80; gonys .40; height at base of bill .40; width at same point .30; legs and toes as in the preceding specimen.

Three specimens of this species examined: one in the Philadelphia Academy from Kamtschatka, which served as the subject of Mr. Cassin's description in the "Birds of North America;" another in the Smithsonian Institution, (No. 22,258,) received from the Bremen Museum, labelled "*Phaleris cristatella*, (Pall.); Winterkleid; Kamtschatka;" another also in the Smithsonian, (No. 15,805,) labelled "*Phaleris cristatella*; Bay of Yedo, Japan; Apr. 1854; eye gray; iris black; Rodgers' North Pacific Exploring Expedition." The last mentioned specimen is in a very poor state of preservation, and is a young bird, as evidenced by the short straight crest, directed backwards; though the bill is nearly perfect in size and shape, and the general aspect of the bird is precisely that of the adult. The other two specimens are in fine condition, and represent the perfectly mature state. These three include all that are known to exist in any American Museum. It is not a common bird in collections, and is frequently mistaken for the young *cristatellus*, to which species, however, it bears only a distant and superficial resemblance.

The bird here described is indubitably the "Dusky Auk" of Pennant, a species more perfectly and satisfactorily described and figured by Dr. Pallas as *Alca tetracula*. It is a strongly marked species, not distantly allied to, and somewhat resembling *cristatellus* in everything but the bill, which is of a radically different formation, as will be impressed upon the mind by a perusal and comparison of the descriptions given under head of these species. *Tetraculus* requires no special comparison with *cristatellus* or with *camtschaticus* for the substantiation of its distinctness. *S. Cassini* of this paper is the most closely allied species, and might just possibly be confounded by a careless or ignorant observer. The differences will be found under head of the latter.

The diagnostic points of this species lie chiefly in the small size and peculiar shape of the bill (cf. descr.); the length of the wings, proportionally greater than in any other species of the genus; and the greater length of the feet and toes. The wings, tail, feet and toes are about of the same absolute dimensions as those of *cristatellus*, although *tetraculus* is rather a smaller bird. The various shades of the dark color of the plumage are produced by admixture of black, brown and gray; there is no pure cinereous or plumbeous on any part of the plumage.

This is a species which entered at a very early day into ornithological literature, notwithstanding which it has not a single accredited synonym. Its claims to recognition as a valid species, distinct from *cristatellus*, have not been impugned, except by the learned Director of the Museum of the Pays-Bas. It has been the occasion of no confusion or conflict of opinion among writers, except in those few instances in which it has been erroneously supposed to have furnished the subject of Audubon's plate of *cristatellus*. The most cursory examination of the plate will convince the mind upon this point. Mr. Pennant, in virtue of his "Dusky Auk," which is this species, would have been entitled to the proprietorship of the bird, had he given it a binomial name; but as it is, Dr. Pallas stands as its lawful sponsor, having christened it *Alca tetracula* in 1769.

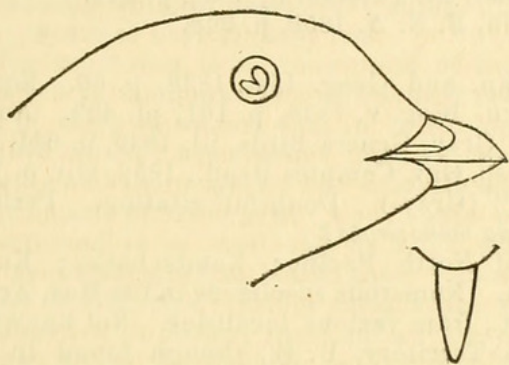
* Pallas gives its color as "fusco-rubrum;" Gmelin, as "ex fusco-lutescens;" Latham, as "luteo-fuscum."

SIMORHYNCHUS CASSINI, Coues, n. sp.

Phaleris Cassini, Coues, mss.

DIAG.—S. rostro parvo, breve, valdè compresso, longitudine vix altitudinem excedente, latitudine dimidii altitudinis; ferè triangulare a spectu laterale; simplice, nec ullis additamentis corneis instructo; culmine leviter declinato-convexo, rictu recto, carinâ ferè rectâ, ascendente; suprâ nigro-plumbeus, vertice, alis caudâque nigerrimis; subtus griseo-plumbeus, abdomine crissoque sensim albicantibus; longitudo tota corporis 7.75 (poll. Ang.); alæ 4.25; caudæ 1.40; tarsi .80; digiti medii cum ungue 1.20; rostri .40, alt. .30, lat. .15; rictûs .60.

Typical and unique specimen, No. 46,564 of the Smithsonian Museum; a male (adult?) collected Aug. 3, 1866, at Ounimak Pass, Russian America, by W. H. Dall.



Bill very small and short, only half as long as the tarsus; extremely compressed, being hardly more than half as wide as high at the base; its height at base three-fourths the length of culmen; lateral aspect of the bill nearly triangular; culmen regularly lightly convex in outline; rictus perfectly straight; gonys almost straight, ascending; tip of bill rather obtuse; no tubercles, sinuosities, or other irregularities of surface or of contour. Nasal fossæ well marked, oval in outline, reaching the culmen at its base,

separated by a ridge from the commissural edge of the upper mandible; nostrils low down in the fossa, small, short, narrowly linear. Frontal feathers laid straight across the base of culmen, descending nearly perpendicularly along the posterior edge of the nasal fossæ, just attaining the posterior end of the nostrils, then retreating obliquely backwards and downwards. Feathers on side of lower mandible extending to a point opposite those on culmen; somewhat further into the interramal space, which is densely feathered. Wings and tail of usual size and shape. Feet small, tarsi moderately compressed, much shorter than the middle toe and without its claw; only two-thirds the middle toe and claw; outer toe as long as, or slightly longer than the middle, its claw much smaller than that of the middle; tip of inner claw just reaching base of middle claw.

Entire upper parts blackish-cinereous, or very dark lead color, deepest and very black on the crown, wings and tail. Entire under parts much lighter and more grayish plumbeous, insensibly blending with the color of the upper parts on the sides of the head, neck, and body, fading very gradually into whitish on the abdomen and under tail coverts. Inner webs of primaries, secondaries and tail feathers dusky gray; the outer glossy black; under surface of wings dusky gray, nearly black along the edge. Bill dusky, tinged with red; tarsi behind and toes below black; rest of feet an undefinable color in the dried state; perhaps reddish in life. "Eyes white and black," (collector's label).

This is a very strongly-marked species, differing to a remarkable degree from any other of the family. The chief peculiarity of form lies in the bill; so small, simple, extremely compressed, destitute of appendages, and otherwise unique, as will be seen by the description, and still more clearly by the diagram. As regards color, the tinge of clear plumbeous which pervades the uniform dark color is very characteristic. There is no trace of a crest, nor 1868.]

of elongated filiform feathers about the head. Their absence, however, is not to be regarded as a specific character, since it cannot be positively affirmed that the specimen is fully adult.

The affinities of the species are clearly with *S. tetraculus*, which it resembles in the small simple compressed bill. But it is unnecessary to compare the two and point out the differences. A glance at the dimensions will alone suffice to show specific distinction. There is no other bird in the family that *S. Cassini* in the least resembles.

SIMORHYNCHUS MICROCEROS, (Brandt,) Coues.

? *Alca pygmæa*, Gmelin, S. N. i, pt. ii, 1788, p. 555, No. 12; and of the older authors. Based on the Pigmy Auk of Pennant. Not identifiable.

Simorhynchus pygmæus, Schlegel, Urinatores Mus. Pays-Bas, 1867, livr. ix, p. 23. Identifies *A. pygmæa* Gm. as *Phaleris microceros* Brandt or *P. nodirostra* Bonap., and *Uria pusilla* Pall. as young of the same.

Phaleris microceros, Brandt, Bull. Acad. St. Petersb. ii, 1837, p. 346.

Phaleris (Ciceronia) microceros, Cassin, B. N. A. 1858, p. 908.

Ciceronia microceros, Reichenbach.

Phaleris nodirostra, Bonaparte, Comp. and Geog. List, 1838, p. 66. Equals *microceros* Brandt. Audubon, Orn. Biog. v, 1839, p. 101, pl. 402. Audubon, B. Amer. vii, 1844, pl. 468. Gray, Genera Birds, iii, 1849, p. 644.

Ciceronia nodirostris, Bonaparte, Consp. Gav. Comptes Rend., 1856, xlii. p. 774.

"? *Phaleris corniculata*, Eschscholtz," (Gray.) Doubtful citation. Perhaps *Fratercula corniculata*? or *Cerorhina monocerata*?

Asiatic and American coasts of North Pacific; Kamtschatka; Kurile Islands; Plover Bay; Sitka; Japan. Numerous specimens in the Mus. Acad., Philadelphia, and Mus. Smiths. Inst., from various localities. Not known to occur as far south as Washington Territory, U. S., though found in the Japan Sea.

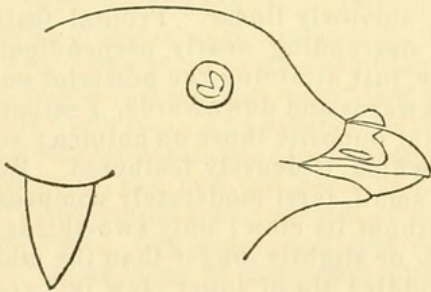


Fig. 11.—*Simorhynchus microceros*, (Brandt).
Nat. size.

Smallest of the Auks with the exception of *S. pusillus*. Bill very short, not half as long as the head, stout, deep, wide, little compressed, obtuse at the tip; its width at base nearly equalling its height at the same point, and but little less than the length of culmen. A small but conspicuous globular tubercle arising from base of culmen, beyond which the culmen is strongly arched, very regularly convex, rapidly descending, its tip not very acute, obsoletely notched on the tomlia, very slightly overhanging the tip of under mandible. Commissure almost straight its whole length, the extremity very slightly ascending. Gonys short, rapidly ascending, very slightly convex. Nostrils in a short but wide and deep fossa, placed rather higher up above the commissure than in some species; narrowly linear, not reached by the frontal feathers. Frontal feathers extending to the node on the culmen, then retreating obliquely backwards as they descend along the sides of the upper mandible; feathers on side of lower mandible extending farther than on upper mandible. Proportions of wings, tail, legs and feet as in other species of the genus.

Adult.—Forehead and lores conspicuously marked with delicate hair lines of white, produced by numerous short, stiff, but very slender white setaceous feathers scattered thickly thereover; a few of which filaments, more elongated and thread-like than the frontal ones, stretch adown the sides of the head

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to below the level of the jaw; and a few more excessively delicate ones reach from the posterior canthus of the eye some distance along the sides of the occiput and nape. Entire upper parts, including the forehead, vertex, occiput, and sides of head, (with the exception of the white feathers just described) sides of neck, and wings and tail, glossy black. Inner webs of the primaries dusky gray. Under wing coverts, (except the smallest row just along the antibrachium and metacarpus,) white. Region about base of under mandible blackish plumbeous, and a few feathers along the sides under the wings and on the flanks blackish; all other under parts white, mottled, especially on the breast and sides, with black, the throat alone remaining immaculate. Bill red, tubercle and base of upper mandible dark bluish. Legs and feet an undefinable dusky in the dried state; the anterior border of the tarsus, and superior aspect of the toes dull greenish.

Length about 6.50; wing from carpus 3.75; tail 1.25; tarsus .70; middle toe and claw 1.00; outer do. the same; inner do. .85; bill: chord of culmen, (including width of knob) .40; along rictus .60; gonys .25; height at base .30; width at base slightly less.

The preceding is a description of the perfect plumage of this species, which is of comparatively unfrequent occurrence. The usual state of plumage of the bird as met with in collections is much as follows:—Bill as described above; filamentous feathers much as above described, but rather shorter and more sparse, and scarcely appearing behind the eye and along edge of side of lower jaw. Upper parts plumbeous black, sometimes slightly interrupted in its continuity by a few whitish feathers about the scapulars; the primaries grayish black, paler on their inner webs; secondaries grayish white at their tips. Under parts white, as before, but very sparsely marbled or waved with dusky; least so on the abdomen, most so on the sides and breast, where the blackish so increases in amount as to appear more or less continuous with that of the upper parts. Chin and sides of jaw as above described, but throat white, immaculate. The dusky mottling varies greatly in amount and in intensity with different specimens. Sometimes it is reduced to a few isolated touches here and there, and again it is found to give the prevailing color to the under parts. That specimens in this mottled condition are not immature, is proven by the fact that the bill is fully grown and provided with a well developed tubercle; and that the forehead is thickly covered with white setaceous feathers. The mottling, however, is confined to the tips of the individual feathers, whose bases are pure white; and is thus *apparently* of a temporary and transient character, like that so frequently met with in young or winter specimens of gulls and petrels. It may be a seasonal feature, or one only found in birds of a certain age; and yet numerous facts tend to indicate it as a character of perfectly mature birds. Were one to examine a specimen with the usual moderate amount of mottling on the under parts, and notice the fact that the blackish occupies only the tips of the feathers, he could not fail to be impressed with the analogy just now hinted at, and to conclude that with advancing age the mottling would grow less and less, and finally disappear, leaving the under parts pure white, as in *pusillus*. Such, however, appears not to be the case. Specimens whose age is attested by a fully developed bill and well formed tubercle, are those most mottled below with blackish. And yet, no specimens have been found with the breast or any other part of the under parts uninterruptedly black, trenchantly divided from white areas. The peculiar kind of mottling exhibited by this species is so unusual as a condition of perfect maturity, that the suspicion arises that the very highest state of plumage is not yet known.

Young.—Entirely similar in plumage to the bird as just described; but the under parts white, scarcely relieved by mottling; and the white extending far around on the sides of the neck, leaving only a narrow median dorsal line black; the bill smaller than that of the adult, and the tubercle wholly wanting.
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ing, or very imperfectly developed; its place on the culmen being occupied by a soft skinny covering like that on the nasal fossæ.

Specimens frequently occur in this condition. An understanding of its precise import is somewhat complicated by the fact that, although the tubercle is entirely wanting, and the bill otherwise obviously undeveloped, the head is well provided with the whitish setaceous feathers. Birds in such condition might be confounded, on casual inspection, with *S. pusillus*. But more careful examination will result in the observation, that the bill is far too large, *thick*, and heavy to be that of *pusillus*; that there is no conspicuous white patch on the scapulars; that the size of the whole bird exceeds that of *pusillus*: which points, in connection with some others which might be enumerated, will serve to distinguish the two species. Their relationships are dwelt upon more at length in the succeeding article.

When old birds of this species are moulting, in the fall, the glossy black of the fresh feathers on the back is interrupted with dull grayish black patches, formed by the old feathers which have not yet been renewed; and the old worn primaries and secondaries are dull grayish, fading almost into grayish white at their tips and along their edges. A specimen in such a condition, (No. 46,563, Smiths. Mus.) though palpably an old bird, has no trace of a caruncle on the bill.

It may not, perhaps, be exceeding due bounds, to hint at the possibility that the nodule on the bill may be temporary in character, assumed after a certain age, at a certain season, and then lost, wholly or in part, by absorption, to be again resumed at the same period of the following year, probably during the season of reproduction. This suggestion presents itself to the observer without straining on his part, and, in fact, is rather forced upon his attention, after examination of specimens, apparently adult, in which no trace of the tubercle is to be found. The tubercle is in essential characteristics an extrinsic formation upon the bill, differing radically in its structure from the rest of the organ. No good reason appears to forbid the supposition that its growth and subsequent re-absorption, may be periodical. Arguments for such a belief might readily be adduced in the periodical hypertrophy and atrophy of the combs, wattles, caruncles, and the various other fleshy or cutaneous or semi-corneous growths about the head and bill of very many birds, which enlarge during the breeding season, and afterwards diminish or entirely disappear. It is also within the limits of possibility that caruncles of this species is a sexual characteristic. The specimen above mentioned, (No. 46,563,) is marked female. However close to, or remote from, the truth either or both of the foregoing suggestions may be, it is certain that observed facts relating to the rostral knob of this bird are at variance with generally received doctrines about it, and are explicable by the application of one or the other of the preceding hypotheses. At present we are very much in the dark in the matter.

Various ages, conditions of plumage and bill, of this species are well represented by the numerous specimens in the Museum of the Philadelphia Academy and of the Smithsonian Institution, from various localities along the coasts and among the islands of the North Pacific. No specimens are contained in any other American collection.

The only questions of synonymy which arise in this case are connected with the identification of *Alca pygmæa*, Gm., and are treated of under head of *S. pusillus*. Prof. Brandt's name has priority over that of the Prince Bonaparte, although the latter has come into more general employ than the former.

SIMORHYNCHUS FUSILLUS, (*Pallas*) *Coues*.

? *Alca pygmæa*, Gmelin. S. N. i, pt. ii, 1788, p. 555, No. 12; "rostro nigro, vertice, cervice, dorso, alis, caudâ pedibusque obscuris, jugulo et pectore glaucis, abdomine sordide albo. * * * alce minor, 7 poll. longa," etc.—Based upon Pigmy Auk, Pennant, Arct. Zool. ii, p. 513, No. 431.

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Habitat between Northern Asia and America. Latham, Ind. Orn. ii, 1790, p. 790, No. ii. Same as Gmelin's species. Bonnaterre, Ency. Method. Orn. 1790, p. 33. Same as Gmelin's species. Donndorff, Beytr. Zool. ii, pt. i, p. 825. Quotes Pennant and Latham.

? *Phaleris pygmæa*, Stephens, Shaws Gen. Zool. xiii, 1825, p. 48. Same as *Alca pygmæa*, Gm. Lath.

Phaleris pygmæa, Brandt, Bull. Acad. St. Petersb. ii, 1837, p. 347. Quotes both *Alca pygmæa* Gm. and *Uria pusilla* Pall., which he considers as synonymous. Gray, Genera Birds iii, 1849, p. 638. Quotes *Uria pusilla*, Pall.

Tylorhamphus pygmæas, Bonaparte Consp. Gav. Comptes Rendus, 1856, xlii. p. 774. Same as *pusilla*, Pall.

Uria pusilla, Pallas, Zoog. R.-A. ii, 1811, p. 373, pl. 70, haud dubiè. "Fronte brachiiisque albo-notatis."

Phaleris pusilla, Cassin, Pr. A. N. S. Phila. 1862, p. 324. Elliot, B. N. Am. 1867, part vi.

Phaleris (Ciceronia) pusilla, Cassin, Baird's B. N. A. 1868, p. 909.

Asiatic and American coasts of the North Pacific. Kamtschatka, (Pallas.) Semiavine Straits (Mus. Smiths. Inst.) N. W. coast of America (Mus. Smiths. Inst.) Sitka, Russian Amer. (Mus. Pays-Bas, teste Schlegel.)

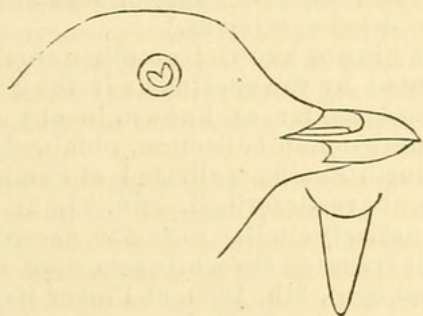


Fig. 12.—*Simorhynchus pusillus*, (Pallas.)
Nat. size.

In size the least of its genus, and the smallest known natorial bird. Length, (approximately correct) 5.50 inches; extent of wings —, wing from carpus to end of first primary 3.50; tail 1.10; tarsus .75, middle toe and claw 1.10; outer toe and claw 1.00; inner toe and claw .85; bill along culmen .40; along rictus, .65; along gonys .30; height at base .20; width at same point the same or slightly less. (Compare these measurements, particularly of the bill, with those of *S. microceros*.)

With the usual form of the genus, except as to the bill, the shape of which is specific. Bill without tubercles, or other irregularities of contour; straight, comparatively slender, compressed; height at base much less than length along culmen; width at base the same, or rather less than, height at same point; the apex more acute than that of *microceros*; the outline of culmen at first straight, then slightly convexo-declinate; commissure almost straight, a little ascending anteriorly, still not sinuous in any part of its length; gonys lengthened, at first convex in outline, then rapidly ascending in a straight line. Nasal fossa large, extending along the basal moiety of the bill, reaching from the culmen nearly to the tomia; not deeply excavated; nostrils small, narrow, linear, one eighth of an inch long, basal, lying just above the commissural edge of the upper mandible. Frontal feathers running forward some distance in a rather narrow angle on the culmen, retreating very rapidly obliquely backwards and downwards on the sides of the upper mandible; extending on sides of the lower mandible a little further than on upper. (It is to be gathered from this description, more particularly, that the bill of *pusillus*, compared with that of *microceros*, is fully as long; but slenderer, more acute at the tip, less convex along culmen and gonys, more compressed in its whole extent, and non-tuberculate.)

Adult.—Entire under parts pure white; entire upper parts pure black, only relieved as follows: The humeral and scapular feathers are, all of them 1868.]

or most of them, white or whitish in some portion or the whole of their extent; producing two patches of this color, not inaptly comparable to the similar patches on the scapulars of *Brachyrhamphus Wrangeli*, or *Collyrio borealis*, in size, shape and general appearance. About half the secondaries, the innermost ones, are quite conspicuously white on the tips of the outer web for a fourth or a third of an inch. The forehead and lores, from the base of the bill to the eyes and vertex, are lineated (exactly as in *microceros*) with sparse, distinct, very slender white setaceous feathers; none are apparent, among several specimens, behind the eye, or from the commissural angle of the bill. Pallas tersely summed up these points of coloration of the upper parts in saying "Fronte brachiisque albo-notatis;" and the white about the "arms" is a strong distinctive feature of the species in comparison with *microceros*. The white of the under parts reaches far around on the side of the neck; on the side of the head it only extends on a level with the commissure; it does not quite attain the base of the lower mandible, being cut off from the bill by a small blackish-lead-colored area. There are indication of a small whitish spot just above and below the eye, formed of feathers of the ordinary texture. The under wing coverts are wholly white, except just along the edge of the forearm. The short tibial feathers are dusky gray. Bill black, (as nearly as can be determined from the dried specimens,) the base, gonyes and tip of lower mandible yellowish. Posterior aspect of tarsus, and inferior surface of toes and webs, blackish; rest of legs and feet a dull undefinable greenish-dusky (in the dried specimens.)

The changes of plumage of this species are not known; no other condition than the one above described is represented by the specimens in the Smithsonian Institution, and none are contained, as far as known, in any other American museum. No. 21,320 of the Smithsonian collection, obtained from Capt. John Rodgers' expedition to the North Pacific, collected at Semiavine Straits by Dr. Wm. Stimpson, is the one above described. No. 21,321, from the same locality, is a younger bird, but entirely similar to 21,320, except that it has a rather weaker bill, and only slight traces of the white setaceous feathers on the forehead. No. 46,562, collected Sept. 9th, 1866, at Plover Bay, by W. H. Dall, of the Western Union Company's Overland International Telegraph Expedition, a young bird, as shown by the soft feel of the feathers and other features needless to detail, is referrible, with some degree of doubt, to this species. The scapulars are very conspicuously white; the secondaries plainly tipped with white; the under parts pure white, unspotted as in typical *pusillus*. The black of the upper parts is tinted, especially about the head, with gray or plumbeous, and there are no traces of whitish setaceous feathers on the forehead; both of which features are to be attributed to the juvenility of the specimen. The doubt in the case centres in the bill. This organ has no trace of a tubercle, and is very small and weak, as usual in the young *pusillus*; but it seems to be deeper, and especially wider at the base, compared with its length, than is the case with typical *pusillus*; in these points of shape approximating to *microceros*. But "seems to be" is the most definite expression to be used in this case, for in the preparation of the specimen, or its subsequent drying or packing for transportation, the bill has been injured, and so much distorted, that its true form cannot now be determined with desirable precision.

It cannot be denied that the relations that this species bears to *microceros* are extremely intimate. So closely, in fact, does it approach the latter, that its specific validity might fairly be called in question by one of conservative views; especially in consideration of the well-known fact, not to be disputed, that the bills of all young *Alcidæ* are much smaller and weaker, and even in more striking points of form, conspicuously different from those of adult birds; and that a long time is required for their perfect development. This remark applies with especial force to the formation of the various knobs, ridges, sulci, rictal callosities, and the other irregularities of surface. The

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mere presence or absence, therefore, of the node upon the base of the culmen, cannot be allowed to constitute a specific character in the present case, and may be left out of consideration, as may be, also, the color of the bill. Too much stress should not be laid upon the presence of white scapulars and of white tips to the secondaries, since in some specimens of undoubted *microceros* unmistakable traces of the former are to be found, and the ends of the inner secondaries are decidedly lighter than the body of the feathers. All the observable differences in the quantity and distribution of the whitish setaceous feathers upon the forehead and other parts of the head might readily enough depend upon a difference in the age of specimens. The pure uninterrupted white of the under parts of *pusillus* stands in apparently strong contradistinction to the black mottling of the same parts of *microceros*; but it is to be remembered that the coloration in this respect of the latter species is very variable, ranging from a very sparse and scanty marbling to a nearly uniform black, particularly upon the breast, and is therefore not to be too implicitly relied upon, at least until it is more definitely ascertained than at present whether the black mottling tends to decrease or to increase with advancing age. If *microceros* grows more and more marbled with black as it grows older, we might with entire propriety presume upon the existence of a youthful state of plumage, in which the under parts are entirely white, like those of *pusillus*. Such is very likely the real state of the case; for the youngest examples of *microceros* examined—those which have no trace of a tubercle—are nearly white below, only very sparsely and indistinctly mottled with blackish. Still, aside from all these varying and therefore uncertain points, there appear good grounds for separating the two species, as will be observed on comparing the descriptions given in this and in the preceding article.

As the case stands with our present information upon the subject, *P. pusillus* is to be separated from *P. microceros*: first, by certain differences positively known to occur: *a*, in size, which is decidedly less, as evidenced by the measurement of all its dimensions; *b*, in form of bill, which is slenderer, more acute at the tip, not so deep at the base, particularly not so wide at the base, yet not shorter, than that of *microceros*; secondly, by certain differences very constantly observed, yet not proven to always hold good: *a*, absence of tubercle; *b*, conspicuously white scapulars and tips of secondaries; *c*, pure white under parts, uninterrupted by blackish mottling, and extending around on the sides of the neck; *d*, shortness and scantiness of the white setaceous feathers on the forehead; *e*, color of bill, mostly black, not mostly red.

It only remains to notice the synonymy of this species, and all that is to be said on this score relates to the identification of *Alca pygmæa* Gm. This name is founded upon the "Pigmy Auk" of Pennant,—a small species first described very loosely and imperfectly by the latter writer, whose account Gmelin merely renders into Latin, in applying a binomial name. There is no doubt that the bird was one of the little Auks of the North Pacific, as its very name, and the dimensions assigned (seven inches), clearly indicate, but there is no possibility, at the present day, of identifying it with precision. It was very possibly based either upon the present species or the preceding (*microceros*), and should these two ever be united, as young and old of the same, the name *pygmæa* might without undue violence be assigned to the species so constituted. So long as they are regarded as distinct, the name *pygmæus* must not be applied to either of them. As far as we can judge by the description, particularly the expression "jugulo et pectore glaucis," *pygmæa* may not impossibly have been based upon *Ptychoramphus aleuticus*. But Mr. Cassin's supposition is perhaps as near the truth as any that could be advanced: "It is possible that the Pigmy Auk of Pennant, which is *Alca pygmæa* Gmelin, may be the young of this species [*microceros*], but it is more probable, judging from the descriptions of Gmelin and Latham, that several small species have been confounded under this name." The same gentleman 1868.]

also calls attention to the fact, that some of the expressions in the diagnoses of the old authors have no basis in the characters of any Alcidine bird. Under the circumstances, it behooves us to ignore the name *pygmæa* altogether, since it cannot be identified; and to accept *pusillus* of Pallas, to which no possibility of doubt attaches, as the proper name of the present species.

PTYCHORHAMPHUS, *Brandt*.

Uria, Pallas, Zoog. R.-A. 1811, ii, p. 370, in part; not of authors.

Ptychorhamphus, Brandt, Bull. Acad. Sc. St. Petersb. ii, 1837, p. 347. Type

Uria aleutica, Pall.

Mergulus, Gambel, Pr. A. N. S. ii, 1842, p. 266, in part; not of Ray, Vieill.

Arctica, Gray, Genera, iii, 1849, p. 638; in part; not of Mœhring.

Simorhynchus, Schlegel, Mus. Pays-Bas, 1867, livr. ix, p. 26, in part; not of Merrem.

Size moderate; general form stout; not crested, nor with any elongated feathers about the head. Bill about two-thirds as long as the head, three-fourths as long as the tarsus, very stout, straight, somewhat conical in shape, slightly if at all compressed, without nodes or irregularities, the tip acute; culmen very moderately declinato-convex in outline, the ridge broad, more or less corrugated transversely at the base; the sides of upper mandible bulging, the tomial edges inflected; sides of lower mandible nearly upright, flat, longitudinally grooved for the greater part of their length, their tomial edges somewhat inflected; rictus straight; gonys straight, or nearly so, very long. Nasal fossæ long and wide, shallow, filled in with soft skin; that of the two fossæ meeting over the base of the culmen, and there corrugated as just described; nostrils rather long, narrowly oval, subbasal, opening at the lower border of the fossæ, the edge of the membrane that overhangs them elevated, flaring. Frontal feathers in a nearly transverse line across the base of the culmen, thence descending a little obliquely backwards, just behind the nostrils, to the commissure; those on lower mandible extending, in the interramal space (which they completely fill), to a point rather beyond a perpendicular from those on culmen; then, encroaching very little on the sides of the lower mandible, they retreat in a straight line rapidly backwards and obliquely upwards. Wings moderately long, narrow, pointed, the primaries somewhat falcate, narrowing rapidly at the tip to an acute point, first longest, rest equably graduated. Tail short, broad, rounded, contained about three and a half times in the length of wing from the carpal joint; the feathers broadly rounded at their tips. Tarsus much shorter than the middle toe without its claw; about two-thirds as long as the middle toe and claw; greatly compressed, covered with small, very irregularly shaped polygonal reticulations; no large transverse scutellæ. Outer lateral toe as long as, or slightly shorter than the middle; its claw not reaching the tip of the middle claw. Tip of inner claw reaching base of middle one. Claws compressed, acute, moderately arched, the inner edge of the middle one dilated.

This genus was instituted in 1837 by Prof. Brandt, for the reception of the *Uria aleutica* of Pallas, its type and only species. It is strongly characterized by the bill, which is of a shape not even approximating towards that of any other Alcidine bird. Its points of structure in other respects are shared by the majority of the family.

PTYCHORHAMPHUS ALEUTICUS, (*Pall*) *Brandt*.

Uria aleutica, Pallas, Zoog. R.-A. ii, 1811, p. 370. "Corpore suprà fusco, subtus albo liturato, rostro producto, triplici plica inter nares."

Ptychorhamphus aleuticus, Brandt, Bull. Acad. St. Petersb. ii, 1837, p. 347. Bonaparte, Tabl. Comp. Pelag. Compt. Rend., 1856, xlii, p. 774. Cassin, Baird's B. N. A. 1858, p. 910. Heermann, Pac. R. R. Rep. x, 1859, Route to Cala. Birds, p. 75. Elliot, B. N. Am. part iv, 1867.

Phaleris aleutica, Gray, Genera Birds, iii, 1849, p. 638.

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Simorhynchus aleuticus, Schlegel, *Urinatores Mus. Pays-Bas*, ix livr. 1867, p. 26.

Mergulus Cassinii, Gambel, *Pr. A. N. S. Philada.* ii, 1845, p. 266. *Id.*, *Journ.*

A. N. S. Phila. 2d series, ii, 1850, pl. vi.

Arctica Cassinii, Gray, *Gen. Birds*, iii, 1849, p. 638.

Pacific coast of North America, south to San Diego, California. Breeds on the Farralone Islands. Aleutian Islands (Pallas), Russian America, and whole west coast of the United States. (*Mus. Smiths. Inst. and Acad. Philada.*)

Adult.—Bill black, base of lower mandible whitish or yellowish. Legs anteriorly, and toes superiorly bluish; legs posteriorly, and toes inferiorly, with the membranes, blackish. A slight touch of white about the eyes. Entire upper parts blackish-plumbeous, the head, wings and tail nearly black. This color, gradually diluted until it is much more grayish-plumbeous, extends around the under parts and sides of the head, the throat, upper part of the breast, and whole sides of the body under the wings. Greater part of breast, with abdomen and under tail coverts pure white; the grayish plumbeous of the upper breast merging very gradually into the white of the belly. Under surface of wings dark lustrous gray.

Young.—Very similar to the adult; differing chiefly in being more decidedly blackish on the upper parts.

Moulting specimens have the upper parts much duller and grayer, the old wing and tail feathers faded, especially towards their tips, into light brownish-gray.

Length 8.00 to 9.50; extent 16.00 to 18.50; wing 4.75 to 5.25; tail 1.50 to 1.75; tarsus about 1.00; middle toe and claw 1.40; outer do. 1.30; inner do. 1.10; culmen .75; rictus .90; gonys .60; depth of bill opposite posterior extremity of nostrils .40; width .30.

As regards color, this species is remarkably constant. Hardly any other differences than those first noticed are to be found, after examination of extensive series; and they may all be summed up as merely varying shades of the same color, and slight variation in its extent downwards upon the breast. The bill at all ages and seasons presents its peculiar parti-coloration. These remarks, however, probably do not apply to fledgelings. As regards size, the species is perhaps unusually variable, as may be seen by the measurements given above, which represent extremes in those cases where two sets of figures are given, and the average in other measurements. The bill, in particular, is liable to great variation both in length and in stoutness. Some bills are very large and robust, nearly as wide as high at the base, rather obtuse at the tip, and with decidedly curved culmen and gonys; others are longer in proportion to their transverse dimensions, decidedly compressed throughout, acutely pointed, with almost straight culmen and gonys. The corrugations about the base of the upper mandible are sometimes nearly obsolete, and when present are very variable in character. Very likely they are hardly, if at all, apparent in life; for they seem to be produced mainly by the shrinking in drying of the skin covering the nasal fossæ and base of the culmen. All the variations exhibited by the numerous specimens seem to be merely individual differences, and are not sufficient to excite a suspicion that more than one species is represented in the series.

Mergulus Cassinii Gambel (*Arctica Cassinii* Gray) is now well known to be this species, first described by Pallas, as above quoted. The species has no other synonyms of consequence. Its striking peculiarities suffice to prevent misconception regarding it.

Subfamily URINÆ.

MERGULUS, (Ray) Vieill.

Mergulus, Ray, *Syn. Av.* Vieillot, *Analyse*, 1816, and of authors. Type *Alca alle*, Linn.

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Plautus, Klein, Prod. Av. p. 140. In part.

Arctica, Mœhring, Av. Gen. 1752, p. 65. Type *Plautus columbarius*, Klein, Gray, Genera, iii, 1849, p. 644. Type *Alca alle*, Linn.

Alca, Linnæus, S. N., i, 1758. In part.

Uria, Pallas, Zoog. R. A. 1811, ii. In part.

Bill very short, culmen only three-fourths the tarsus, very stout, scarcely compressed, obtuse at the tip, as wide as high at the base, the sides of both mandibles convex or vaulted, the tomial edge of the upper greatly inflected, the culmen very convex in outline, with a broad flattened ridge, the rictus ample, much decurved towards the end, the gonys straight, very short, the inferior mandibular rami correspondingly elongated, widely divaricating, the interramal space very broad, the nasal fossæ short, wide, deep, partially feathered. Nostrils subbasal, short, more broadly oval, or more nearly circular than in any other genus except *Synthliborhynchus*. Wings rather longer than usual in this family, acutely pointed. Tail of ordinary length, much rounded, the feathers rather narrow and subacuminate at tip. Feet small and weak; tarsus scarcely compressed, anteriorly broadly scutellate, posteriorly finely reticulate. Toes of the usual proportionate lengths. Size very small; general form very compact, stout.

A peculiar genus of the *Alcidæ*, the most essential characters of which, as usual in this family, are found in the bill, though the other members offer some appreciable, if not salient features. The squat bunchy shape of the single species is very noticeable.

This is the genus through which a certain type of structure found among the Longipennes inosculates with the Pygopodes. The relationship of *Pelecanoides urinatrix* to *Mergulus alle* is one of strong analogy, if not of actual affinity, as has been elsewhere already pointed out by the writer.* Aside from the obviously Procellariidian characters of the bill, *Pelecanoides* (representing the subfamily *Halodrominæ*) is strictly a Pygopodous genus, and is very nearly identical with *Mergulus* in all the details of external structure, and has much the same general habitus. It is certainly the connecting link between the macropterous and brachypterous natatores, holding so strangely anomalous a position betwixt the two, that it cannot be with much propriety included under either. It seems entitled to the rank of a family, to take place between the *Procellariidæ* and *Alcidæ*.

MERGULUS ALLE, (Ray) Vieill.

Mergulus melanoleucus, Ray, Syn. Av. p. 125. Stephens, Shaw's Gen. Zool. xiii, 1825, p. 345. Brandt, Bull. Acad. St.-Petersb. ii, 1837, p. 347. Brewer, oct. ed. Wilson's Orn., with notes by Jardine, 1840, p. 658, fig. 315. Fleming, Hist. Brit. Anim. 1842, p. 135. Thompson, Nat. Hist. Ireland, iii, 1851, p. 218.

Columba grænlantica, "Albanus, Av. p. 81, pl. 85. Gunn., Act. Nidroff, i, p. 206, pl. 6."

Plautus columbarius, Klein, Prod. Av. p. 146, No. 1.

Alca alle, Linnæus, S. N. ed. x, i, 1758, p. 131, No. 6. Id. *ibid.* ed. xii, 1766, i, p. 211, No. 5. Brünnich, Orn. Bor. 1764, p. 26, No. 106. Hermann, Tab. Affin. Anim. p. 149. Müller, Zool. dan. Prodr. p. 17, No. 142. Latham, Ind. Orn. ii, 1790, p. 795, No. 10. Donndorff, Beytr. Zool. ii, pt. i, 1794, p. 823, No. 5.—Donndorff's Var. B is *candida* Lath.—Wilson, Am. Orn. ix, pl. 74, fig. 5. Schlegel, Urinatores Mus. Pays-Bas, ix livr. 1867, p. 20.

Uria alle, Pallas, Zoog. R.-A. ii, 1811, p. 369. Temminck, Man. Orn. ii, 1820, p. 928. Bonaparte, Obs. Wils. 1826, No. 238. Audubon, Orn. Biog. v, 1838, p. 304, pl. 339.

Uria (Mergulus) alle, Bonaparte, Synopsis, 1828, p. 425.

* Cf. Pr. A. N. S. Philada. May, 1866, pp. 172, 189.

Mergulus alle, Vieillot, Analyse, 1816, p. 66. Id., Gal. Ois. 1825, p. 236, pl. 295. Gould, Birds Eur. v, 1837, pl. 402. Macgillivray, Hist. Brit. Birds, ii, 1852, p. 341. Bonaparte, Comptes Rendus, 1856, xlii, p. 774. Cassin, Baird's B. N. A. 1858, p. 918. Boardman, Pr. Bost. Soc. N. H. Sept. 1862, p. 131. Verrill, Proc. Essex Inst. iii, 1863, p. 160. Samuels, Ornith. and Ool. of New England, 1867, p. 570.

Arctica alle, Gray, Gen. Birds, iii, 1849, p. 644.

Alca alce, Gmelin, S. N. i, pt. ii, 1788, p. 544, No. 5.

Alca candida, Brünnich, Orn. Bor. 1764, p. 26, No. 107. In pure white plumage; probably albino.

Mergulus arcticus, Brehm

European and American coasts of the North Atlantic. On the United States coast, in winter, south to New Jersey. Numerous specimens in Mus. Acad. Philada., Smiths. Inst., Bost. Soc. Nat. Hist., Essex Inst., Cab. G. N. Lawrence, author's Cab., etc.

Adult, summer plumage.—Head and neck all around, and entire upper parts glossy black, with a beautiful metallic lustre of a shade of blue, when in highest plumage; scapulars edged with white; shafts and inner webs of primaries brown, lighter at base; secondaries tipped with white; under surfaces of the wings brownish-gray; under parts from the breast pure white, with a few elongated feathers of the sides and flanks varied with black on the outer webs; bill black; legs and feet posteriorly blackish, anteriorly flesh-colored (dull yellowish in the dried state).

Adult in winter.—As before; the white of the under parts extending on the neck and throat to the bill, on the sides of the head to the level of the rictus, on the sides of the nape over the auriculars (where it is somewhat marbled with black), or even to the middle of the nape, more or less confluent with that of the other side.

Young, first winter.—Recognizable by its smaller and weaker bill, by the duller and more brownish black of the upper parts, almost wanting in gloss, and by the greater extension of the white upon the sides of the hind head and neck. The scapulars and coverts are conspicuously marked with white, as in the adult. The feet are mostly dusky.

Length 8.50; wing 4.75; tail 1.50; tarsus .80; middle toe and claw 1.20, outer do. 1.15, inner do. .85; bill along culmen .50, rictus 1.00, gonys .20; its depth at base .35, its width at same point about the same.

When in mature plumage, this is a very beautiful species. No other Alcidine has such lustre of the dorsal plumage, traces of which are even found in adult winter specimens. In the latter the extent of the black upon the throat is indicated by a dusky clouding of the bases of the feathers of the parts. The species is ordinarily subject to only moderate variation in size or colors. The condition of albinism has been described.

The first chronicles of this species are of great antiquity. It appears to have shared for a time with *Uria grylle* the soubriquet of "*Columba grœnlandica*." Since its description as *Alca alle* by Linnæus, it has been the basis of very few synonyms. *Alca candida* of Brünnich is this species in the albino state. *Mergulus melanoleucus*, Ray, is adopted by many authors. Mr. G. R. Gray adopts Mœhring's generic appellation.

SYNTHLIBORHAMPHUS, Brandt.

Alca, Gmelin, S. N. i, 1788, p. 554, and of the older authors, in part.

Uria, Pallas, Zoog. R.-A. ii, 1811, and of some authors, in part.

Fratercula, Stephens, Shaw's Gen. Zool. xiii, 1825, in part.

Synthliborhamphus, Brandt, Bull. Acad. St. Petersburg. ii, 1837. (Type *Alca antiqua*, Gm.) Subgenus of *Brachyrhamphus*, Brandt.

Mergulus, Vigors, Zool. Voy. Blossom, 1839, in part.

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Arctica, Gray, Genera, iii, 1849, in part.

Anobapton, Bonaparte, Comptes Rendus, 1856, xlii. p. 774, in part.

Size moderate or rather small; general form stout, compact; head with or without a crest; bill somewhat as in *Brachyrhamphus*, but much stouter, and shorter for its depth; much compressed throughout, depth at base about half the length of culmen, culmen and gonys moderately curved, gonys straight, ascending; nasal fossæ small and shallow; nostrils subbasal, broadly oval or nearly circular, as in *Mergulus*, feathered; feathers extending to about the same distance on culmen and keel; on both mandibles retreating rapidly backwards from the point of their furthest extension; those on the upper passing just by the nostrils, but not covering the latter. Wings of usual size and shape in this group; secondaries very short, as in *Brachyrhamphus*, the tip of the longest not reaching much more than half-way from the carpal joint to the end of the first primary in the closed wing. Tail of usual length, short, broad, nearly square, or very slightly rounded, the feathers very broadly rounded at tip. Tarsi much compressed, anteriorly and laterally transversely scutellate, posteriorly reticulate; about as long as the middle toe without its claw. Outer toe as long as or rather longer than the middle; its claw smaller than that of the middle; tip of inner claw reaching base of middle. Claws small, short, compressed, moderately curved and acute, the inner edge of the middle one somewhat dilated.

With the general appearance of *Brachyrhamphus*, this genus differs from the latter in the bill and feet. The bill is deeper at the base, and more compressed throughout; the feet are still more different, having very broad transverse scutellation on the anterior face of the tarsus, instead of polygonal reticulation; and are larger, both relatively and absolutely, with longer, much more compressed tarsi than in *Brachyrhamphus*. The type of the genus is the old *Alca antiqua* Gm. A second species occurs, which differs from the type, as far as form is concerned, in a slenderer bill, and in the presence of a conspicuous crest.

Species.—(2.)

Not crested; bill stout, depth at base more than half the length of culmen; white on sides of vertex not extending in advance of the eyes..... *antiquus*.

Crested; bill slender, depth at base about equal to half the length of culmen; white on sides of vertex extending along sides of forehead nearly to the bill..... *wurmizusume*.

SYNTHLIBORHAMPHUS ANTIQUUS, (*Gmel.*) *Brandt*.

Alca antiqua, Gmelin, S. N. i, pt. ii, 1788, p. 554, No. 11. Based upon Antient Auk, Pennant, Arct. Zool. 1785, ii, p. 512, No. 430. Latham, Ind. Orn. ii, 1790, p. 795, No. 9. Donndorff, Beytr. Zool. ii. pt. i, 1794, p. 824. Schlegel, Urinatores Mus. Pays-Bas, livr. ix, 1867, p. 21.

Fratercula antiqua, Stephens, Shaw's Gen. Zool. xiii, 1825, p. 42.

Uria antiqua, Temminck and Schlegel, Fn. Japon. 1845, pl. 80. Audubon, Orn. Biogr. v, 1839, p. 100, pl. 402, fig. 12. Id. B. Amer. vii, 1844.

Brachyrhamphus (*Synthliborhamphus*) *antiquus*, Brandt, Bull. Acad. St. Petersburg, ii, 1837, p. 347. Cassin, Baird's B. N. A. 1858, p. 916.

Brachyrhamphus antiquus, Gray, Gen. Birds, iii, 1849, p. 644.

Anobapton (*Synthliborhamphus*) *antiquus*, Bonaparte, Cons. Gav. Comptes Rendus, 1856, xlii, p. 774.

Uria senicula, Pallas, Zoog. R.-A. ii, 1811, p. 369, pl. 85.

Mergulus cirrhocephalus, Vigors, Zool. Voy. Blossom, 1839, Birds, p. 32.

Arctica cirrhocephala, Gray, Gen. Birds, iii, 1849, p. 644.

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American and Asiatic Coasts of the North Pacific. Kamtschatka, Japan Seas. Sitka, Russian America, (Mus. Smiths. Inst.) Mus. Acad. Philada.

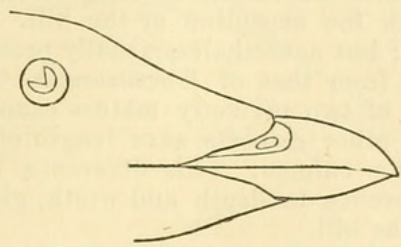


Fig. 13.—*Synthliborhamphus antiquus*, (Gmel.)
Nat. size.

With the form, etc., typical of the genus, as above described.

Adult, high breeding plumage, (No. 46558, Mus. Smiths. Sitka, R. A.) Bill whitish, or yellowish, culmen and base of both mandibles abruptly black; legs and feet anteriorly apparently whitish, or yellowish; posteriorly, with both surfaces of the webs, black. Head all

around, and throat, black; pure and intense above, on the sides below, chin and throat, tinged with fuliginous brown. A conspicuous stripe of pure white beginning over each eye, and extending backwards over the sides of the occiput, connected across the nape by some white feathers, and spreading on the sides and back of the neck, as a large disconnected series of trenchantly defined white streaks. Trace of white on each eyelid. Entire upper parts clear dark plumbeous, blackening on the upper tail coverts and tail. Upper surface of wings the same, or rather darker, the edge of the wing all along from the elbow, and the exposed parts of primaries, blackish; entire under surface of wings white, except just along the edges where it is mottled with dusky; the basal portion of the inner webs and shafts of primaries whitish; secondaries like the wing coverts, or rather darker, their bases whitish. Sides of the body under the wings pure velvety black, in marked contrast to the clear plumbeous of the upper parts and white of the lower. These black feathers are posteriorly greatly elongated, reaching quite to the tail, and overlying the sides of the rump and the flanks, which latter, however, are seen to be pure white on raising the elongated supercumbent feathers. This black along the sides extends anteriorly in front of the wings, and, still strongly contrasted with the plumbeous of the interscapulars, continues on as a band quite to the nape, which it crosses to become confluent with its fellow of the opposite side. On the sides of the neck it is thickly marked with the pure white streaks already described. The fuliginous black of the chin and throat is continuous with that of the sides of the head as far as the auriculars; further on it merely extends as a point along the middle of the throat, being separated from the black of the sides of the nape by a large white area, an extension to the auriculars of the white which is the color of the whole under parts except the sides under the wings, as already described.

Length 9.50 to 10.50; extent 16.75 to 18.25; wing 5.50; tail 1.60; bill along culmen .60, along rictus 1.20, along gonys .40, depth at base .30, width .20; tarsus 1.00; middle toe and claw 1.25, outer do. 1.15, inner do. 1.00.

Younger.—Bill and feet as above described. "Iris brown," (label). Upper parts as in the adult, but darker, the plumbeous being obscured by dusky, especially on the wing and tail coverts, and lower back. Forehead, crown, nape, and back of neck, sooty black, entirely unrelieved by white streaks, or with only traces of the latter on the sides of the occiput. Eyelids sometimes largely white. No black on the throat or chin; traces of it in a dusky mottling about the base of the bill. White of under parts extending on sides of head below and behind nearly to the eyes, and far around on the sides of the nape, so that only a median nuchal line is left blackish. Sides of body under the wings not pure black, but merely dusky plumbeous, and this not continuous on the feathers over the flanks, these being in some part white, producing a white and plumbeous variegation. The line of this dusky plumbeous hardly extends in front of the wings to the sides of the neck. Under parts white, as before, the bases of the inner webs of the primaries rather more white than in the adult.

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The above described differences between the adult and young are very decided, and might suggest a distinction of species, were not various means between the extremes forthcoming. Beyond these variations in plumage the species is very constant in characters, with the exception of the bill. This differs a good deal as to its size and shape; but nevertheless usually preserves the specific characters which distinguish it from that of *Wurmizusume*. Thus the difference in length between the bills of two perfectly mature examples, absolutely identical in plumage, and in all other respects, save length of bill, amounts to a tenth of an inch along the culmen. This difference being unaccompanied by a corresponding difference in depth and width, gives a readily appreciable difference in shape of the bill.

The only species to which the present bears any special resemblance is *Wurmizusume*. The comparative characters of the latter are dwelt upon at length in the article immediately succeeding.

It is barely possible that two distinct species may be confounded in the synonymy adduced at the head of this article, and that the bird here described is not the veritable *Alca antiqua*, Gm., ("Antient auk" of Pennant.) In the description of these authors the upper parts are said to be dusky or sooty black, whereas, as will be seen by the description, the subject of the present article has these parts clear plumbeous. But we have just seen that the young of the present bird has the upper parts decidedly darker and duller than the adult; in fact tending, especially upon the wings and lower back, to dusky. The limits within which the species is known to vary in this respect are sufficiently wide to allow its reference to the bird of Pennant, Latham and Gmelin; especially when it is remembered that the particular descriptive terms used by these authors may not have been critically correct. It seems unnecessary, and it would be, perhaps, unjustifiable to attempt to discriminate the present species from *Alca antiqua*, upon the grounds just mentioned. They had best be regarded as the same, at least until suites of specimens may determine the existence of two species, differing in the particulars above mentioned. No indications of a distinction of species can be found in the extensive series of specimens at present contained in American collections.

This species, in the condition here described as that of the adult, is the *Uria senicula*, Pallas; and should bear the name of *Synthliborhamphus seniculus* in the event of its not proving the same as *Alca antiqua*, Gm. *Mergulus cirrhocephalus*, Vigors, (*Arctica cirrhocephala*, Gray,) is the same bird, in the same condition of maturity. The species has no other synonyms of consequence, except those resulting from its reference to several different genera.

In breeding plumage it is a very handsome bird, being in fact—with the exception of *Wurmizusume*—the handsomest of the *Urinæ*. It is of frequent occurrence along the coast and among the islands of the North Pacific; extending, on the Asiatic side, to Japan, and on the American, to Washington Territory, U. S. It apparently migrates southward in winter. It breeds in the vicinity of Sitka, R. A. It is well represented by numerous specimens in the collections of the Philadelphia Academy and of the Smithsonian Institution. It has been figured by Temminck and Schlegel, and by Audubon.

SYNTHLIBORHAMPHUS WURMIZUSUME, (*Temm.*) *Coues*.

Uria Wurmizusume, Temminck, Pl. Color, No. 579. Temminck and Schlegel, Fn. Japon, 1845, pl. 79.

Anobapton (Synthliborhamphus) Wurmizusume, Bonaparte, Tab. Comp. Pelag. Comptes Rendus, 1856, xlii, p. 774.

Brachyrhamphus (Synthliborhamphus) Temminckii, Brandt, Bull. Acad. St. Petersburg, ii, 1837, p. 347. Cassin, Baird's B. N. A. 1858, p. 916.

Brachyrhamphus Temminckii, Gray, Gen. Birds, iii, 1849, p. 644. Cooper and Suckley, Pac. Rr. Rep. xii, p. ii, 1860, p. 287. Elliot, B. N. Am. part vi, 1867.

Alca Temminckii, Schlegel, Urinat. Mus. Pays-Bas, livr. ix, 1867, p. 22. (Japan.)

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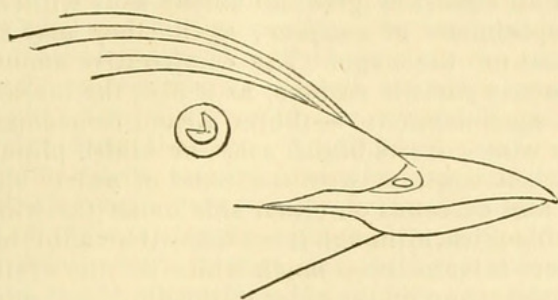


Fig. 14.—*Synthliborhamphus Wurmizusume*, (Temm.)
Nat. size.

Asiatic and American Coasts of the North Pacific; south to Japan and Washington Territory, U. S. Specs. in Mus. Acad. Philadelphia, and Mus. Smiths. Inst.

Bill more slender and elongated than in the type of the genus, the depth at base less, and the compression not so great, the sides of the bill being less vertical; rictus nearly straight. Rather larger than *S. antiquus*.

Adult.—Bill decidedly yellow, (in the dried state,) the ridge of upper mandible alone black. Feet dull livid bluish, the webs dusky, (feet dusky yellowish in the dried state) "Eye brilliant gray, iris black" (label). A large conspicuous crest springing from the extreme forehead of a dozen, (more or fewer) slender elongated features, not recurved, but extending straight backwards quite to the occiput. A large conspicuous series of white feathers on each side of the top of the head, extending from the base of the crest, on the forehead far in advance of the eyes, to the side of the nape; there more or less confluent with each other, and then dispersed as isolated white streaks over the sides of the neck to the shoulders. In many specimens, however, apparently quite adult, these white stripes are hardly, if at all, apparent beyond the nape. Rest of head, including chin and upper part of throat sooty or fuscous blackish, sometimes with a cinereous tint; this color extending as far as the interscapular region, from which point the upper parts are more decidedly plumbeous, only the wings and tail being somewhat darker and more fuscous. Sides under the wings plumbeous black quite to the flanks; this color also extending forward in front of the wings and continuous with that of the sides of the neck and head. Under surface of wings pure white, except a little dusky clouding along the edge; bases of primaries, and the greater portion of their inner webs white, deepening very gradually through a continuously deepening shade of brownish gray, into dusky at the tips. Entire under parts (except the sides, as just described) pure white.

Length 10.50 to 11.00; extent 18.00 to 18.50; wing 5.50; tail 1.75; tarsus 1.00; middle toe and claw 1.25, outer 1.20, middle 1.00; bill along culmen .70, rictus 1.10; gonys .40; height at base .25 to .30, width about the same.

Younger.—Bill and feet as above; (bill sometimes, however, wholly blackish.) Without a crest; no white feathers about head, or only slight traces thereof. Face, including region just about the base of the bill, both above and below, crown and sides of the head to the level of the commissure, with nape and back of neck, plumbeous dusky; other upper parts, particularly the wings, the same, but most of the back with a more decided tint of plumbeous. Under wing coverts and primaries as in the adult. Sides under the wings narrowly fusco-plumbeous, the lengthened feathers over the flanks variegated with white. Entire under parts otherwise white; this color extending far around on the sides of the upper neck, nape and occiput.

Considerable variation in plumage as well as in size, and to a degree, in shape of bill, is exhibited by the numerous specimens examined. The differences in the bill are chiefly those of size, the relative proportions of the various measurements being pretty constantly preserved. The bill is always slenderer, and usually longer than that of *antiquus*, approaching in this respect the bills of the true *Brachyrhamphi*. The size of the whole bird varies somewhat, but not to any remarkable degree. In apparently equally adult specimens, the two series of white feathers, which form conspicuous stripes on the sides of the vertex and nape, vary much in length. Sometimes they spread
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out on the sides of the hind-neck to almost as great an extent as is witnessed in the most highly plumaged specimens of *antiquus*; again they may stop abruptly on the occiput, or at least on the nape. The comparative amounts of dusky and plumbeous on the upper parts is various, as is also the intensity of either of these hues. Thus a specimen, (No. — Phila. Acad., from Japan,) has the upper parts including the wing coverts bluish ashy, or bluish plumbeous, light enough to form a marked contrast with the band of nearly black which crosses the nuchal region, and descends on either side under the wings. In this specimen, also, the bill is blackish, although it is evidently an adult bird, having a crest an inch long. There is sometimes much white on the eyelids, sometimes none. The outline of the white on the sides of the hind head and of the neck varies; the younger the bird, the more the white encroaches on these parts.

It is not ascertained positively that the crest which so strongly characterizes perfect specimens of this species as a constant feature, that is, obtained at a certain age, and ever afterwards worn. Very possibly, it is only assumed during the breeding season; and falls off afterwards, so that perfectly adult winter specimens may be without it. It is at all events not to be enumerated among the infallible diagnostic points of the species.

Compared with *S. antiquus*, the species is at once distinguished, when in adult breeding plumage, by the presence of a crest, and the different extent of the white stripes and streaks upon the head, nape and neck. (Consult descriptions above given.) These differences aside, it is a larger bird, on an average, though some specimens do not exceed in size some examples of *antiquus*. The bill is slenderer, though not necessarily longer, more acute at the tip, comparatively not so deep at the base, and rather less compressed, the culmen, rictus and gonys straighter. The identification of very young birds, however, is sometimes attended with difficulty; and some specimens in the present collections cannot, in fact, be satisfactorily determined. This state of affairs, however, is by no means unparalleled in other cases of perfectly distinct species; and by no means militates against the belief in the specified distinction of the two birds now under consideration. The adults cannot by any possibility be mistaken for each other.

This species is well represented in all its variety, by numerous specimens in the collections of the Philadelphia Academy and the Smithsonian Institution; though not contained, as far as heard from, in any other American cabinets. It is of frequent occurrence on the coasts of the North Pacific, and appears to be particularly abundant in the vicinity of Japan, whence most of the specimens described or recorded have been obtained. Its occurrence on the coast of the United States is open to question. Several specimens of *S. antiquus* (at least of the bird described in this paper under this name) are in our collections from Washington Territory, labelled "*Brachyrhamphus Temminckii*," and these appear to represent the species whose habits, etc., are alluded to by Drs. Cooper and Suckley, volume twelve, part ii, of the Pacific Railroad Reports, (Nat. Hist. Wash. Terr. p. 287, above cited) under the name of *Brachyrhamphus Temminckii*. But the description there given is that of the true *Temminckii*, having been copied from Mr. Cassin's article on the "Birds of North America."

The name which heads this article has priority over "*Temminckii*" of Prof. Brandt, and is therefore to be adopted, though its barbarous character is, assuredly, a matter of regret. It varies in orthography with different writers.

BRACHYRHAMPHUS, *Brandt*.

Colymbus, Gmelin, S. N. i, 1788; in part; not of authors.

Uria, Latham, Ind. Orn. ii, 1790; in part; not of authors.

Cephus, Pallas, Zool. R. A. ii, 1811, in part.

Brachyrhamphus, Brandt, Bull. Acad. St. Petersburg, ii, 1837. Type *Colymbus marmoratus*, Gm.

Apobapton, Brandt, l. c. Same type.

Anobapton, Bonaparte, Comptes Rendus, xlii, 1856. Same type.

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With the general habitus of *Uria* proper, but of much more delicate build, different pattern of coloration, and very small size. Bill small, slender, much shorter than the head, not longer than the tarsus, greatly compressed, acutely tipped; culmen gently curved, its ridge sharp, rictus nearly straight, gonys straight; tomial edge of upper mandible greatly inflected towards the base, notched near the tip. Nasal fossæ small and shallow, nearly filled with feathers, which mostly cover the extremely minute oval nostrils. Wings of ordinary length, very narrow, pointed, falcate, the secondaries extremely short. Tail of ordinary length, almost square, the feathers obtusely rounded. Feet very small, short, slender, and weak; tarsus scarcely compressed, variable in length, never longer than the middle toe without its claw (except in *brachypterus*?) Outer and middle toes equal in length; the claw of the former much smaller than that of the latter; the inner very short, its claw not reaching the base of the middle claw. Claws small, weak, moderately curved, very acute.

The genus which comprises the Murrelets—to coin an English word, needed for the *Brachyrhamphus*,—is a very natural and strongly marked one. It comes nearest to *Uria* proper, from which, however, it is sufficiently distinguished, as will be seen by the above diagnosis. It contains four or five species, all inhabitants of the North Pacific, and more particularly of the west coast of North America. These may readily be diagnosticated as follows:—

Species:—(5.)

- I. Tarsus much shorter than the middle toe without its claw.
 Upper parts blackish and chestnut, lower parts blackish and white..... 1. *marmoratus*.
 Upper parts cinereous and white, lower parts pure white..... 2. *Wrangeli*.
- II. Tarsus just as long as the middle toe without its claw.
 Under surface of wings white 3. *hypoleucus*.
 Under surface of wings dusky..... 4. *Craveri*.
- III. Tarsus longer than the middle toe without its claw, (teste Brandt)..... 5. *brachypterus*?

BRACHYRHAMPHUS MARMORATUS, (Gm.) Brandt.

Colymbus marmoratus, Gmelin, Syst. Nat. i, 1758, p. 583, No. 12. Based on the marbled guillemot, Pennant,* Arct. Zool. ii, p. 517, pl. 22, and Latham, Syn. vi, p. 336, pl. 96. Donndorff, Beytr. Zool. ii, pt. i, 1794, p. 870.

Uria marmorata, Latham, Ind. Orn. ii, 1790, p. 799. Stephens, Shaw's Gen. Zool. xii, 1824, p. 249. Bonaparte, Synopsis, 1828, p. 423.

Brachyrhamphus (*Apobapton*) *marmoratus*, Brandt, Bull. Acad. St. Petersburg, ii, 1837, p. 346. Cassin, Birds N. A. 1858, p. 915; in part. Description of supposed adult is that of *B. Wrangeli*.

Brachyrhamphus marmoratus, Gray, Genera Birds, iii, 1849, p. 644. Cooper and Suckley, Nat. Hist. Wash. Terr. 1860, p. 286, in part. Not the description of supposed adult, which is that of *B. Wrangeli*.

Anobapton (*Brachyrhamphus*) *marmoratus*, Bonaparte, Tabl. Comp. Pelagiens, Comptes Rendus, 1856, xlii, p. 774.

Cephus perdux, Pallas, Zoog. R.-A. ii, 1811, p. 351, pl. 80.

Uria Townsendii, Audubon, Orn. Biogr. v, 1839, p. 251, pl. 430; octavo ed. vii, 1844, pl. 475. The figure of the supposed young is the adult; that of supposed adult may be really *B. Wrangeli*.

* "With a black bill; crown dusky; throat, breast, and belly mottled with black and white; back and sides very glossy, and marbled with black and rust-color; wings dusky; greater coverts edged with white; tail black; legs yellow; webs black. Length 9 inches." Pennant, l. c. From Prince William Sound. Of this species, Vieillot, (Nouv. Dict. xiv, 1817, p. 36,) not exhibiting great sagacity, remarks, that it is "une jeune guillemot grylle, qui commence à prendre la livrée de l'adulte!"

? *Uria brevirostris*, Vigors,* Zool. Journ. iv, 1828, p. 357, and Zool. Beechey's Voy. Blossom, 1839, Ornith, p. 32. Evidently a young bird; may be of this species, or of *B. Wrangeli*.

? *Brachyrhamphus Kittlitzii*,† Brandt, Bull. Acad. Sc. St. Petersburg, ii. 1837, p. 346. Young bird; may be of this species, or of *Wrangeli*, or a distinct species.

Coasts and Islands of the North Pacific. On the American side, south in winter to California; breeds as far south as Vancouver's Island. Numerous specimens in Mus. Acad. Philada., Mus. Smiths. Inst., Cab. G. N. Lawrence.

Form typical of the genus as just described. Bill along culmen just the length of the tarsus, tarsus scarcely three-fourths the middle toe without its claw.

Adult, breeding plumage. (Description from No. 49655, Mus. Smiths. Inst., ♂, June 9, 1867, Vancouver's Island.‡ Bill black. Tarsi posteriorly and both surfaces of the webs blackish; legs anteriorly and toes superiorly livid flesh color, or dull bluish gray. Iris brown. Entire upper parts brownish black, everywhere transversely barred with chestnut brown, or bright rust color, except on the wings, which are uniform brownish black, the primaries darkest, their inner webs brownish grey towards the base. Under surface of wings smoky brownish black. A few whitish feathers variegated with chestnut and dusky on the scapulars. Entire under parts, including sides of head, neck and body, marbled with sooty brownish black and white. The feathers are white, with the tips of the dark color. The white rather predominates on the middle of the breast and belly, the dusky on the other parts; the latter color being nearly uniform across the throat, and on the long feathers of the sides and flanks.

Specimens vary a great deal in the precise amount of rusty brown on the upper parts, and of dusky mottling on the lower; but, so far as known, are never without this distinctive coloration in some degree; and it becomes heightened at the breeding season..

Length about 10·00; extent about 18·00; wing 5·00; tail 1·50; tarsus ·70; middle toe 1·00, its claw ·20; outer toe and claw 1·15, inner do. ·90; bill along culmen ·70, along rictus 1·35, along gonys ·55, height opposite base of nostrils ·25, width at same point ·20.

This species was originally described by Pennant as the Marbled Guillemot, whence *Colymbus marmoratus*, Gm. His description is that of the adult, in breeding plumage, but has been almost universally supposed to refer only to the young; and a very different species has been usually held to be the adult, as shown in the next article. It is also evidently the *Cephus perdix* of Pallas.

* "U. supra griseo-fusca, capite, dorsoque albo notatis; subtus alba, fusco undulatum maculata, rectricibus albis, duabus mediis fusco-notatis, rostro brevi, gracili.—Alæ supra et infra, tectricesque inferiores fuscae. Rostrum nigrum. Pedes flavi, membranis unguibusque brunneis. Longitudo corporis 9; rostri ad frontem $\frac{1}{2}$, ad rictum $1\frac{1}{8}$, alæ $5\frac{1}{4}$; caudæ 1; tarsi $\frac{1}{2}$." Vigors, l. c. From San Blas.

† "Supra cinerea nigricante et pallide e fusco-flavescente undulata et submaculata. Subtus alba, subfuscescente tenuissime lavata, nigro et quidem in pectore frequentius undulata. Alæ e cinerascante et fusco nigrae. Rostrum brevissimum, capitis longitudinis tertiam partem circiter adæquans. Tarsi digito medio breviores. Longitudo a rostri apice ad caudæ apicem 9. Patria Kamtschatka."—Brandt, l. c.

‡ The following is an extract from a letter to Prof. Baird, from J. Hepburn, Esq., dated Victoria, Sept. 5, 1867, which accompanied a lot of specimens of which No. 49655 was one. It confirms the views maintained in the present paper, and gives some interesting facts: "You will find in the box a specimen of *B. marmoratus*. On comparing it with Mr. Cassin's description, (in Birds N. A.) I find it is what he calls the young bird. In this he is mistaken. In the first place, if such were the case we should see some red birds among the large numbers that are to be found here, whereas till this year I never saw but one specimen, * * * In the next place, when I fell in with them last May, every bird was in the red plumage, including the one which, as I told you, would have laid an egg in two or three days; and lastly, proof conclusive, I have shot the young bird, two-thirds grown, in the winter plumage of the adult, except that the breast is more thickly barred than in any specimens I have seen in the winter, and at the very time the adults were in their red plumage."

Audubon's figure and description of the supposed young of this bird, under the name of *Uria Townsendii*, is really that of the adult. His figure of the supposed adult appears rather to represent *Wrangeli*.

It is difficult, perhaps impossible, to determine *Uria brevirostris* Vigors. This is evidently, as far as can be judged by the description, a young bird. It belongs to the short-legged group of the present genus; but whether it is the young of *marmoratus* or of *Wrangeli*, is a point which cannot be decided. The expression "capite dorsoque albo-notatis," and the absence of any mention of rust-color in the description, would lead one to assign it rather to *Wrangeli*.

Brachyrhamphus Kittlitzii, Brandt, is another bird which has not been identified since its original description. Like *U. brevirostris*, it is evidently a young bird, of the short-legged group; and the expression "fusco-flavescente undulata" induces the presumption that it is really only a young *marmoratus*. But it is possible that both it and *B. brevirostris* may be the young of the same species, or of two different species, which yet remain to be identified. It is not probable, however, that either of these names represent valid species, distinct from each one of those recognized in this paper.

BRACHYRHAMPHUS WRANGELI, Brandt.

Brachyrhamphus Wrangeli, Brandt, Bull. Acad. St. Petersburg, ii, 1837, p. 344. "Rostrum capitis dimidii circiter longitudine. Caput supra, nucha et dorsum e nigricante grisea. Alæ et cauda nigræ. Reliquæ partes, nec non stria longitudinalis supra alam, albæ. Tarsi digito medio breviores. Longitudine a rostro apice ad caudæ apicem $9\frac{1}{2}$. Patria Insulæ Aleuticæ." Cassin, Birds N. A. 1858, p. 917. Copies Brandt's diagnosis.

Brachyrhamphus marmoratus, Cassin, B. N. A. 1858, p. 915, in part. Description of supposed adult *marmoratus* is that of *Wrangeli*.

Aleutian Islands, and north-west coast of America; south to Puget's Sound, and perhaps further. Numerous specimens in Mus. Smiths. Inst. (No. 11,457, perfectly adult, Puget's Sound, in February; No. 46,547, just fully fledged, Sitka; and others from same locality in various stages of adolescence; No. 46,542, Sitka, in January.)

Description (from No. 46,541, Mus. Smiths., perfectly adult male, Sitka, March, 1866).—With the size and proportions of the several members as in *marmoratus*; the bill absolutely shorter, relatively rather stouter. Bill scarcely as long as the tarsus. Tarsus much less than middle toe without claw.

Adult.—Entire upper parts, except the scapulars, very dark cinereous, the centres of the feathers, particularly on the back and rump, blackish, causing these parts to appear obsoletely waved with blackish and cinereous; the crown of the head, the wings and the tail, almost black, the larger wing coverts just appreciably white-margined; scapulars almost entirely pure white, forming two conspicuous broad longitudinal bands. Under wing coverts dusky brown; inner webs of the primaries the same, not fading, even at their extreme bases, into whitish. Entire under parts pure white, immaculate, except some dusky streaks on the long feathers of the sides and flanks. This white on the sides of the head invades the lores to the level of the top of the orbits, and extends into the nasal fossæ; then lowers a little, so that the eyes are left in the dark color of the top of the head; then on the nape extends almost to the median line, across which a few white feathers extend to the white on the other side, forming an imperfect nuchal collar; then extends in a straight line down the middle of the side of the neck. On the sides of the rump the white extends around so far, that the cinereous is only left as a band an inch wide. This white on the sides of the rump is as apparent upon the upper surface as that on the scapulars; it is directly continuous with that of the under parts, but on the flanks the long overlying cinereous feathers appear to separate it. Bill wholly black. Tarsi posteriorly and toes inferiorly blackish; rest of the feet, 1868.]

including both surfaces of the webs, probably flesh-colored in life; dull yellowish-white in the dried skin.

Length "10.00, extent 18.00" (collector's label); wing from carpus 5.00; tail 1.50; tarsus .70; middle toe without claw .92, its claw .20; outer toe and claw 1.10; inner do. .88; bill along culmen .60, along rictus 1.25, along gonys .45, its height at base of nostrils .22, its width at same point .19.

Young. (No. 46,547, Mus. Smiths., Sitka, July, 1866; just fully fledged; the bill has still the white horny knob at tip of upper and under mandible, showing the juvenility of the specimen).—Bill very small, weak, short, imperfectly developed, about a third as long as the skull; .45 along culmen; tarsus .55; middle toe and claw 1.00; wing only 4.25. Entire upper parts blackish, much darker than in the adult, with only a just appreciable shade of cinereous; the scapular white present, but restricted in extent, and interrupted by imperfect bars of dusky across the feathers. Entire under parts white. Everywhere, except on chin, middle of abdomen, and under tail coverts, thickly marked with delicate waved lines of dusky, most numerous across the throat, largest on the sides and flanks, where some of the longer feathers are mostly dusky, finest on the lower breast. The whitish on the sides of the head does not extend so far, and merges insensibly into the dark color; on the nape a delicate line of white feathers almost forms a collar. The under wing coverts are as in the adult. Bill blackish. Legs and feet anteriorly more dusky than in the adult.

Another specimen (No. 46,542, Mus. Smiths.), taken in January, marked female, and evidently hatched the preceding summer, has the size of the adult, and the colors generally as in the young bird just described. But the upper parts are much lighter and more decidedly cinereous, as in the adult; the scapular white well developed; the dusky waving of the under parts confined to the sides and throat. The under wing coverts are dusky along the edge of the wing; but are elsewhere variegated with dull whitish; only to a small degree, however, not approaching the condition seen in *hypoleucus*.

In mature plumage this is a very handsome bird, and recognizable at a glance by the pure white of the under parts, and blackish cinereous of the upper, relieved by the conspicuous white of the scapulars and sides of the rump. It belongs to the short-legged division of the genus, being very different from *hypoleucus* and *Craveri* in the proportions of the tarsus and toes. It has the size and form of *marmoratus* in every respect except a just fairly recognizable difference in the shape of the bill. But it is quite a different species from *marmoratus*; so different, in fact, that no special comparison need be instituted.

The recognition, in the bird here described, of *Brachyrhamphus Wrangeli*, Brandt, is a matter of unusual interest, identifying, as it does, a species long ago described, but almost unknown to ornithologists at large, and throwing light upon what has always been a very obscure point in American ornithology. The writer is mainly indebted to Prof. Baird's suggestions for the fortunate direction of his investigation in this case. The present species has hitherto been regarded and described by American writers as the *adult* of the well-known *marmoratus*, whose curious colors, as described by all authors from Pennant downwards, and as figured by Audubon under the name of *Uria Townsendii*, have always been considered as indicative of immaturity. But numerous specimens, in adult *breeding* plumage, demonstrate the falsity of this view, as is satisfactorily set forth in the preceding article. Beyond the possibility of a doubt, the present species is not *marmoratus*; and it is certainly *Wrangeli* of Brandt.

BRACHYRHAMPHUS HYPOLEUCUS, *Xantus*.

Brachyrhamphus hypoleucus, Xantus, Proc. Acad. Phila. Nov., 1859. From Cape St. Lucas. Baird, eodem loco.

Coast of California. Specs. in Mus. Smiths., and Mus. Acad. Philada. So far south, in summer, as Cape St. Lucas, Lower Cal.

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Description (from No. ———, Mus. Smiths., ♀, San Diego, Jan. 27, 1862; a typical example).—Bill along culmen half as long as the skull, three-fourths as long as the tarsus, as long as the middle toe and half its claw, very slender, much compressed, higher than wide at the base; culmen gently curved its whole length; rictus nearly straight; gonys perfectly straight; outline of the very slender mandibular rami a little concave. Tarsus just as long as the middle toe without its claw! Tip of inner lateral claw not reaching base of middle one. Wings and tail of usual shape; the latter contained about two and a third times in the length of the former from the carpus. Under tail coverts reaching (in this specimen) just beyond the end of the tail. Entire upper parts uniform cinereous, not varied by white. This color is slightly darker, and more blackish-plumbeous on the head. It extends on the sides of the head just to the eyes, the lids of which are of this color, a little further down on the auriculars; thence in a straight line along the middle of the side of the neck to the shoulders; thence in a straight line along the sides under the wings, where it is nearly an inch broad; the elongated feathers of the flanks are also mostly of this color. Other under parts entirely pure white. Under surface of wings entirely pure white! Primaries black on the outer web; the greater part of the shaft and inner webs white; the terminal portion of the shaft and inner webs brown. Tail feathers black, the inner webs somewhat brownish. Bill black, the base of the lower mandible whitish; feet anteriorly dull yellowish, posteriorly dusky, in the present dried state; "bill black, feet whitish-blue, black below" (label).

"Length 10.50; extent 17.50" (label); wing 4.80; tail 1.70; tarsus .95; middle toe without claw .95, its claw .20; outer toe and claw 1.10; inner do. .90; bill along culmen .80, along rictus 1.30, along gonys .45; depth at base .22; width .19.*

The specimen above described, collected at San Diego, Cal., by Dr. J. G. Cooper, is a little larger than the type, as will be seen by comparing the measurements with those in the accompanying foot-note. It is also described as representing the perfect plumage,—the type being imperfect in this respect. The upper parts are of a uniform very dark cinereous, without a shade of brown; the latter hue only occurring in specimens with worn and faded plumage. In the original description, here appended, the indications of the size of relative lengths of the tarsus and middle toe are made without reference to the claw; which fact explains an apparent discrepancy between the present description and the original one. The tarsus is exactly as long as the middle toe without its claw.

This is a very strongly marked species. The most striking diagnostic feature is the pure white of the under surface of the wings. In the uniformity of the cinereous color of the upper parts it is also unique. Nearly the same length of tarsus is found in *B. brachypterus*, Brandt, and *Craveri*, Salvadori; the tarsus is much shorter than the middle toe in *Wrangeli* Brandt, *marmoratus* Gm., "*Kittlitzii*" Brandt, and "*brevirostris*" Vigors.

This species is certainly not the *Uria brevirostris* Vigors, from San Blas. This is described as having "alæ suprâ et infrâ, tectricesque inferiores fuscæ, * * tarsi $\frac{1}{2}$," which settles all questions on this score. It has the same dimensions, and the same relative length of tarsus and toes as *Craveri* Salva-

*The following is the original description of the type specimen: "Bill slender and slightly curved, about half the length of head. Tarsus scarcely shorter than the middle toe [and claw]. Above dark brownish-black, the edges of the feathers with a decided plumbeous tinge; the side of neck below, and the axillars with the concealed portion of the sides of the breast, ashy plumbeous. Entire under parts, including tail coverts and inside of the wings, pure white, this color extending on the sides of the head so as to include the eyes; the lids, however, are tinged with dusky; bill black; legs apparently reddish in life.

"Length 10 inches, extent 15.80, wing 4.70, tail 1.80, bill above .70, gape 1.20, tarsus .85, middle toe [with claw] 1.00. This specimen is considerably weather-beaten, and the old feathers of the upper parts are much worn, and bleached at the edges. The new ones are, however, as described."

dori, also from the coast of Lower California; but the latter appears to be a different species, as will be discussed further on. It comes nearest to *brachypterus*, from Unalashka; in fact there is nothing in Brandt's brief diagnosis preventing the reference of the present species to *brachypterus*, except the expression "tarsi digito medio longiores." But in view of this discrepancy, and of the widely-separated localities whence the two species are described, it would be unsafe to take their identity for granted. It is much the best course to retain the present species as it stands, under the name *hypoleucus*, which has the merit of being positively identified, as is not the case, as yet, with *brachypterus*.

Several excellent examples of this species from various points along the coast of California are in the collections of the Smithsonian Institution and Philadelphia Academy. They present no individual differences worthy of special mention; except in the instance of the type specimen, which is brownish above, from the faded and worn condition of the plumage.

This species has probably the southernmost range of any of the family; occurring in summer at Cape St. Lucas. It was observed by the writer in December, 1865, off the coast of Mexico, about latitude 21° N. Its extension northward remains to be ascertained. At present, it is not known to occur north of the coast of Lower California. Its southern habitat, as remarked by Prof. Baird, is a fact of great interest, when it is recollected how truly boreal are nearly all the species of the family.

BRACHYRHAMPHUS CRAVERI, (*Salvad.*) *Coues*.

Uria Craveri, Salvadori, Descrizione di altre Nuove specie di Uccelli esistenti nel museo di Torino, 1867, p. 17. Estratto dagli Atti della Società Italiana di Scienze Naturali, vol. viii, 1866.

"*Jun.*—*Uria minima*, crassitie *Merguli alle*; suprà fusco-nigra, dorso ac alis nonnihil griseo-tinctis. Subtus alba; rostro valde elongato, subulato, nigro; tarsis postice nigris, antice viride-luteis; unguibus nigris.

"Long. tot. 0,245; al. 0,125; caud. 0,018; rostri a rictu 0,037; tarsi 0,022; dig. med. cum ungue 0,024; (millimetres.)

"Parti superiori, lati della testa, le piume del mento lungo il margine inferiore della mandibula, lati del collo, del petto, e fianchi di color bruno-nero con una leggera tinta grigio-lavagna sul dorso, sul groppone e sulle ali; parti inferiori candide; becco nero; tarsi neri posteriormente, anteriormente giallo verdastri come anche le dita; unghie neré.

"Questa specie sarebbe commune lungo le coste del Golfo della California, e nell' Isola della Natividad posta nel Pacifico, a poca distanza dalla costa occidentale della Bassa California."—Salvadori, l. c.

This recently described species has much the same habitat as *B. hypoleucus*, and very much resembles the latter. The dimensions are the same in both, and the colors are very nearly alike. The expression "fusco-nigra, * * * griseo-tinctis," exactly hits some specimens of *hypoleucus*,—those somewhat faded and worn in plumage,—though not applicable to more perfect specimens. In the above copied description, no mention is made of the under surfaces of the wings; but the needed information in this regard has been supplied through a private channel. Prof. Baird has received from Sig. Salvadori, and kindly transmitted to the writer, a life-size figure of the bird, accompanied by a note in which it is stated that "the lining of the wings is blackish, and some feathers are white-edged." This fact at once distinguishes the species from *hypoleucus*, providing the latter, in all stages of plumage, has the under surfaces of the wings white, as is most probable, judging by what is known of the variations in plumage of the birds of this genus.

Waiving the bare possibility of this bird's being a young *hypoleucus*, it cannot be referred to any described species, and must be regarded as a valid one. That it is not *brevirostris*, Vigors, is sufficiently evident from the dimensions; the tarsus of the latter being only half an inch long.

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BRACHYRHAMPHUS BRACHYPTERUS, *Brandt*.

Brachyrhamphus brachypterus, Brandt, Bull. Acad. Imper. St. Petersburg. ii. 1837, p. 346. Quotes "*Uria brachyptera* Kittlitzii, MSS." Gray, Genera, iii, 1849, p. 644. Cassin, Birds N. A. 1858, p. 917. Merely copies Brandt's description. *Anobapton* (*Brachyrhamphus*) *brachypterus*, Bonaparte, Tab. Comp. Pelagiens, Comptes Rendus, xlii, 1856, p. 774.

"Suprà cinerea, alis caudaque nigricantibus. Collum subtus et in lateribus, pectus et abdomen alba. Rostrum capitis dimidii circiter longitudine. *Tarsi digito medio longiores*. Longitudine a rostri apice ad caudæ apicem 9. Patria Unalaschka."—*Brandt, l. c.*

This species is wholly unknown, at least on this side of the Atlantic, except by the above cited description of Brandt. It has nothing to distinguish it from some other *Brachyrhamphi* except the length of the tarsus. This, however, if it really obtains, is sufficient to distinguish the bird from all others, not only of the genus, but of the family; for no known alcidine bird has the tarsi longer than the middle toe.

URIA, (*Moehr.*) *Brisson*.

Columba sive *Columbus*, Auct. antiq. ex parte. *Vria*, Moehring, Av. Gen. 1752, p. 67, No. 73. Type *Columba groenlandica*, Willoughby.

Uria, Brisson; Brünnich, Orn. Bor. 1764; and of authors generally.

Alca, Linnæus, Syst. Nat. i, 1758; in part.

Colymbus, Linnæus, S. N. i, 1766, in part, and of many of the older authors.

Cephus, Pallas, Spic. Zool. v. 1769, in part.

Grylle, Brandt, Bull. Acad. St. Petersburg. ii, 1837, p. 346. Type *U. grylle*, Brünn.

Bill much shorter than the head, about equal to the tarsus, straight, rather stout, moderately compressed; culmen at first straight, then rapidly deflected; rictus straight, except just at tip; gonys ascending, straight, short, about half as long as the culmen. No groove in sides of upper mandible near its tip; commissural edge of upper mandible scarcely inflected. Nasal fossa wide, long, deeply excavated, partially bare of feathers, which do not wholly obstruct the nostrils. Feathers extending on sides of lower mandible with a salient rounded outline. Wings and tail very short, the latter contained about two or two-thirds times in the length of the former from the carpal joint to the end of longest primary; tail slightly rounded. Tarsus much compressed, entirely covered with polygonal reticulations, somewhat scutelliform on the inner aspect; slightly shorter than the middle toe without its claw. Outer and middle toes equal in length; the claw of the former much smaller than that of the latter, tip of inner claw just reaching base of middle one. Claws compressed, moderately arched and acute; the outer one grooved along its outer aspect, the middle one greatly dilated along its inner edge. No postocular furrow in the plumage.

In the preceding diagnosis the characters of the genus are so drawn as to exclude the large species of *Lomvia*. Few writers have made this generic distinction, for which, notwithstanding, there is abundant reason, as may be seen upon a critical comparison of the two types of form; and as will be satisfactorily demonstrated at length under head of *Lomvia*. It need only be noted here, that the structure of the bill and feet are in many respects very different in the two genera.

The genus as here framed comprehends three distinct species, intimately allied to each other.

Species :—(3.)

Disregarding other and less prominent though very valid distinctions, the three species of *Uria* may be at once recognized by the following characteristics :—

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- A large white space on wing, entire. No white about head 1. *grylle*.
 A large white space on wing partially divided by a black line. No white about head..... 2. *columba*.
 No white on wing. Feathers around and behind eye and at base of bill, white..... 3. *carbo*.

Or they may be still more briefly and quite as satisfactorily characterized thus:—*carbo*—upper and under surfaces of wings black; *grylle*—upper and under surfaces of wings white; *columba*—upper surfaces of wings white, under black.

The division of the white mirror on the upper surface of the wings of *columba* is not the most important point of coloration, though the most obvious, upon casual inspection, by which the species differs from *grylle*. A still stronger diagnostic character lies in the absence of white on the under surface of the wings.

URIA GRYLLE, (Linn.) Brünn.

- Columba groenlandica*, "Linnæus, Syst. Nat. vi, ed. 1746, p. 23, No. 4. Albanus, Av. ii, p. 73, pl. 88. Ray, Syn. Av. p. 121, No. 6. Willoughby, Orn. p. 245, pl. 78. Martens, Spitzburg. p. 56, pl. 50, fig. B."
Columbus groenlandicus, "Klein Av. p. 168, No. 2."
Uria groenlandica, Brünnich, Orn. Bor. 1764, p. 28, No. 116, (blank.)
Uria nigra, striata, et minor, Brisson.
Alca grylle, Linnæus, Syst. Nat. i, 1758, p. 130. Schlegel, Urinatores Mus. Pays-Bas. livr. ix, 1867, p. 130, excl. synonym. *Cephus columba*, Pall.
Colymbus grylle, Linnæus, Syst. Nat. i, 1766, p. 220. Hermann, Tabl. Affin. Anim. p. 148. Blumenbach, Handb. Naturg. p. 220. Müller, Zool. Dan. Prodr. p. 18. Gmelin, Syst. Nat. i, 1788, p. 584. Donndorff, Beytr. Zool. ii, pt. i, 1794, p. 871. Several states of plumages enumerated as varieties.
Uria grylle, Brünnich, Orn. Bor. 1764, p. 28, No. 113. Latham, Ind. Orn. ii, 1790, p. 797, No. 2. Var. "B," is *columba*; perhaps also var. "E," the same. Temminck, Man. Orn. ii, 1820, p. 925. Vieillot, Gal. Ois. ii, 1825, p. 235, pl. 294. Bonaparte, Syn. B. N. A. 1828, p. 423. Audubon, Orn. Biog. iii, 1835, p. 148, pl. 219 and B. Amer. vii, 1844, p. 474. Peabody, Rep. Nat. Hist. Mus. 1840, Birds, p. 399. Gray, Genera Birds iii, 1849, p. 644. Thompson, Nat. Hist. Ireland, iii, 1851, p. 214. Macgillivray, Hist. Brit. Birds, 1852, ii, p. 331. Cassin, Birds N. A. 1858, p. 911, pl. 96, fig. 2; and Pr. A. N. S. Philada. 1862, p. 323. Herald Island. Bryant, Proc. Bost. Soc. Nat. Hist. May, 1861, p. 74. Coues, Pr. A. N. S. Philada. 1861, p. 225. Verrill, Proc. Bost. Soc. Nat. Hist. 1862, p. 131, and p. 142, and Proc. Essex Inst. iii, 1863, p. 160. Samuels, Ornith. and Ool. New Engl. 1867, p. 567.
Uria (Grylle) grylle, Brandt, Bull. Acad. St. Petersb. ii, 1837, p. 346.
Uria (Cephus) grylle, Bonaparte, Comptes Rendus, 1856, xlii, p. 774.
Cephus grylle, Fleming, Hist. Brit. Anim. 1842, p. 134.
Cepphus lacteolus, Pallas, S. Z. v, 1769, p. 33. Albino, perhaps *columba*.
Colymbus lacteolus, Gmelin, Syst. Nat. i, 1788, p. 583. Albino. "C. niveus, rostro pedibusque ex carneo fusciscentibus." Donndorff, Beytr. Zool. ii, pt. i, 1790, p. 870.
Uria lacteola, Latham, Ind. Orn. ii, 1790, p. 798. Albino.
Uria grylloides, Brünnich, Orn. Bor. 1764, p. 28, No. 114. Changing plumage.
Uria balthica, Brünnich, Orn. Bor. 1764, p. 28, No. 115. Immature or winter.
Uria nivea, Bonnaterre, Ency. Method. Orn. 1790, p. 37. Albino, possibly of *columba*. Quotes Pall. Spec. Zool. v, p. 33.
Uria leucoptera,* Vieillot, Nouv. Dict. d'Hist. Nat. xiv. 1817, p. 35.

* "Cet oiseau, dont je ne connais pas le pays natale, est totalement d'un noir profonde, avec une grande plaque blanche sur l'aile; sa taille est à peu près la même que celle du précédent," (*U. troile*)—Vieill., l. c.

Uria unicolor, Faber, Prodr. Isl. Orn. 1822, p. teste Schlegel. Greenland. without white on wings.

Uria (Lomvia) unicolor, Bonaparte, Comptes Rendus, 1856, xlii, p. 774.

Uria Mandtii, Lichenstein, Verz. 1823, p. 88, teste Schlegel. Spitzenbergen.

Not of authors, which usually refers to *columba*.

Uria scapularis, Stephens, Shaw's Gen. Zool. xii, 1824, p. 250, pl. 64.

Cephus glacialis, arcticus, Faroensis, et Meisneri, Brehm.

European and American coasts and islands of the North Atlantic; very abundant. Arctic Ocean. Spitzbergen, Iceland, Greenland. On the American coast, in winter, south to New Jersey coast. Rare or accidental in the north Pacific, where replaced by *columba* and *carbo*.—? Kamtschatka, (Mus. Pays-Bas, fide Schlegel.)* Herald Island, Arctic Ocean, (Cassin, Pr. A. N. S. Ph. 1862, p. 323); Spec. in Mus. Acad. Phila., Smiths. Inst., Bost. Soc. Nat. Hist.; Essex Inst.; Cab. G. N. Lawrence; author's Cab.

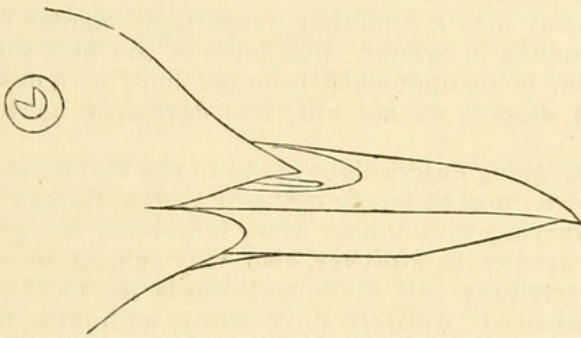


Fig. 13.—*Uria grylle*.—Nat size.

This perfect breeding plumage is temporary, and lasts but a short time. Very many individuals do not assume it until June; and it is usually retained only during this and the succeeding month. Most specimens collected in May are found to still have some traces of the winter plumage, below described.

Adult, during autumnal change. The first indication of the moult is seen in the wings and tail, and is to be observed in nearly all specimens taken after July. By the latter part of this month, after incubation and nursing are finished, the wing and tail feathers become much worn, and faded, turning to a light brownish gray towards their tips. The white mirror shows scattered traces of dull brown. The body color loses its hue of green, and becomes more fuliginous brown. Isolated white feathers are scattered over the whole body; or the dark feathers acquire white tips. With the falling of the quill feathers, which may take place very rapidly, and deny for a season all power of flight, the bird is in the following condition, which is the pure *moulting* state, exactly intermediate between the summer and winter plumages:—No. 18254, Mus. Smiths., Labrador, Aug. 14, 1860. E. Coues. Wing feathers renewed, pure black, but not fully grown; wing from the carpus only 4.50 long. Mirror of renewed feathers, almost or quite pure white, but small; under wing coverts and axillars pure white. Head and neck all around, rump, and whole under parts marbled with black and white in equal quantity, the bird looking as if dusted over with flour. Back black, most of the feathers lightly bordered with white, the scapulars more largely white. A still further increase of white produces the following:—

Adult, winter plumage.—Wings and tail black, the mirror and under wing coverts faultlessly white. Head and neck all around, rump and entire under

* Although this author does not recognize the specific validity of *U. columba*, and would therefore range specimens of the latter under *grylle* in his catalogue, a specimen (No. 5.) there enumerated appears to be this species, as is inferrible from the expression "Au miroir d'un blanc pur."

parts pure white; the back, (and frequently the crown, and back of neck,) black, more or less variegated with white. Audubon figures this condition very nearly.

The change in spring—mostly occurring during April and May—is the reverse of that already described as the autumnal moult.

Fledgelings.—(Labrador, July, 1869, E. Coues, Mus. Smiths. No. —.) Length about 6·00; bill ·50; tarsus ·60; middle toe and claw ·90, etc. Wholly covered with soft wooly puffy down, fuliginous brownish black; bill and feet brownish black.

Young, first plumage.—Traces of the down on various parts of the body; the bird probably just beginning to fly; length about 10·00, wing 11·50; bill 1·00, black; tarsus 1·25; reddish dusky, as also are the toes. Upper parts plumbeous or sooty black, scarcely varied with white. Mirror beginning to appear, as white spotting on a blackish ground. Entire under parts white, thickly marbled, rayed and undulated with light touches of dusky.

This state tends to pass directly into a condition exceedingly similar to, if not identical with, that of the adults in winter. But birds of the first winter may, at least early in the season, be distinguished from old ones by a certain "feel" of the plumage, and a shorter, weaker bill, less developed as to its ridges and angles.

Accidental variations.—The foregoing descriptions apply to the various stages of plumage, which are strictly normal in character, and which, though unending in precise degree, and varying with almost every individual, merge insensibly into each other. The species is, however, also very subject to accidental and entirely abnormal variations. Of these, albinism is the most common. (Spec. in Mus. Acad. Philada.) Entirely milk white, without a trace of black; bill and feet light colored; eyes probably pink in life. The opposite condition of melanism is described by authors. This consists in the total absence of white on the wings; and is apparently of infrequent occurrence. Both these conditions have been described and named as characterizing distinct species. In the latter, the bird must not be confounded with *Uria carbo*, which is totally different.

Dimensions.—Adult: Length, (average) 13·00; extent, (average) 22·50; wing 5·50 to 6·25; tail 2·00, a little more or less; bill along culmen 1·30; along rictus 1·75; along gonys ·65; depth at base ·45, width ·35; tarsus 1·25; middle toe and claw 1·75, outer do. slightly less, inner do 1·40.

It may be of advantage to look closely into the formation of the white area upon the wing of this species, to the end that its composition may be clearly understood, and recognized as different from that which obtains in the allied species, *U. columba*. The mirror upon the upper coverts varies to a degree, and in a precisely similar way, in each species; but when perfect constantly presents a radical difference.

When *Uria grylle* is observed flying, as is its wont, low over the water with rapid beats of the wings, the eye receives the impression of a black bird, with a large white circular spot on the wing. This spot is constantly in view, and represents the retinal image resulting from the white spaces upon both the upper and under surface of the wings blended together by the rapid motion of the wings. Those who have observed *Uria grylle* in its native haunts will appreciate the pertinence of this remark. *Uria columba* presents no such peculiarity of appearance, there being no white upon the under surface of the wings; and the eye readily follows the movement of the small white space upon the wings, as with the changing attitudes of the bird, it is now apparent, now lost to view.

In *Uria grylle*, the row of great coverts upon the secondary quills are basally black, terminally white. The outermost are white for rather less than half their length, and the white occupies chiefly the exterior webs. Nearer the body they are white for more than half their length, and the white occupies both webs of the feathers.

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The next row of coverts are wholly white in their entire length, except perhaps for a very brief space just at their base; and they are throughout long enough to cover entirely the dark portion of the first row, reaching a little beyond and overlying the commencement of the white upon the latter; so that the white is continuous and unbroken. One or two more rows of coverts have precisely the same character and continue the white space uninterrupted.

The shorter coverts, for about half inch from the edge of the antibrachium are black. The last of these, however, are broadly tipped with white, which white portion overlies the extreme bases of the next row, blending its color with that of the latter; the anterior edge of the mirror being thus the line of union of the black and white portions of these coverts, taken collectively.

In *Uria columba*, the row of great coverts is externally wholly black, or at most the outermost feathers have only a very narrow white tip. The amount of white on the feathers increases rapidly from without inwards, until on the innermost there is nearly or quite as much white as in *grylle*. In consequence of the small amount of white on these coverts, the next row of coverts do not overlie, nor even reach it; there being left a broad space of dusky between the white tips of the second row of coverts, and those of the first; which space rapidly diminishes from the edge of the wing towards the body, forming the curved crescent of dusky which is obvious upon the wing of this species.

The mirror of *Uria grylle* is subject to much variation, which, however, never obscures its distinctive characters in any decided degree. The greater coverts may be wholly dusky; then the mirror is the same as before, except in its smaller size; the next row may be tipped with dusky, so that no white comes forward to coalesce with that of the greater row, and an appearance like that of *columba* is produced; which need not deceive, since the dusky results from the second row of coverts instead of the first. All the wing coverts may be tipped with dusky; producing a variegated or spotted mirror. Finally, the mirror may be only indicated by a few isolated white feathers, or may be altogether wanting.

It is to be borne in mind, that the difference in the mirror of *U. grylle* and *columba* is only one of the most obvious, but not the most specific distinction. In the very possibly occurring cases in which there is absolutely no difference between specimens in this respect, the absence of the white under the wing, and the shape of the bill, readily distinguish *columba* from *grylle*.

Perhaps no bird has so many synonyms as *Uria grylle*. Independently of its reference to divers genera, a large number of nominal species have been instituted upon its various stages of plumage, some of them requiring brief notice. A very common name for the species among pre-Linnæan writers was "*Columba groenlandica*,"—obviously a mere rendering into Latin of a popular designation. The word "*grylle*" made an early entry into the records, designating the adult plumage. *Grylloides* of Brünnich represents a variegated condition; and *balthica* of the same author an immature or winter state. *Lacteolus* of the older authors seems to have been based upon the albino condition; the bird being described as "*niveus, rostro pedibusque ex carneo fusciscentibus*." It is possible that Pallas, who introduced the word, may have really based it upon a specimen of *columba*; but this is a point of no special consequence. Bonnaterre has another name,—"*nivea*"—for the same condition, quoting Pallas, Sp. Z. v, p. 33. Brisson and Brehm both have a large number of nominal species, not necessary here to particularize. In 1817, Vieillot (l. *suprà* cit.) describes an adult under the name of *Uria leucoptera*, erroneously assigning it dimensions nearly equal to those of *Lomvia troile*. At least the presumption is that this *leucoptera* is nothing but a large *grylle*, though he must have been perfectly familiar with the latter. Even so late as 1824, *grylle* is redescribed as *Uria scapularis*.

The "*Uria Mandtii*" of Lichtenstein requires attention, having been extensively quoted as a synonym of, or employed to designate, *U. columba*, as will 1868.

be seen by the list of synonyms under head of this species. It is not possible to determine from the description whether *Mandtii* is really based upon *columba* or upon *grylle*. But Dr. Schlegel describes a specimen from Spitzbergen in the Mus. Pays-Bas.—“un des individus types de l'*Uria Mandtii* de Lichtenstein, obtenu du Musée de Berlin,” as having the white feathers of the mirror tipped with clear brown, and the wing and the tail feathers faded grayish. This is a common condition of autumnal specimens of *grylle*; and the description does not point more particularly to *columba* than to this species. Upon the whole, it may be best to regard *Mandtii* Licht. as a synonym of *grylle*; though the name as used by Brandt, Bonaparte and some others refers unmistakably to *columba*.

A certain *Uria unicolor* is described by Faber and Benecken and admitted as distinct in the Comptes Rendus for 1856, by Bonaparte, who moreover places it in a different subgenus from *grylle*. Bonaparte does not use the term to designate *carbo* Pall., which latter he gives as distinct. The name seems to have been based upon the melanotic state of plumage of *grylle*. Dr. Schlegel describes, in the ninth livraison of the Mus. Pays-Bas Catalogues, one of Faber's type specimens from Greenland, as being “Au plumage d'un noir enfumé absolument uniforme.”

URIA COLUMBA, (*Pallas*) *Cassin*.

Black Guillemot, variety from Kamtschatka, “with a white oblique line issuing from the white spot on the wings,” Pennant, Aret. Zool. ii, 1785, p. 517.

Uria grylle, var. B, Latham, Ind. Orn. ii, 1790, p. 797. “Fuliginosa, fascia alarum gemina alba. Lath. Syn. vi, p. 333, No. 3, var. a. Habitat in Aoonalashka.”

Colymbus grylle, var. B, Donndorff, Beytr. Zool. ii, pt. i, 1794, p. 872. Quotes Latham and Pennant.

Cepphus columba, Pallas, Zoog. R.-A. 1811, ii, p. 348. “In speciminibus orientali oceani, fascia alarum duplex,” etc. (p. 349.)

Uria columba, Cassin, Voy. Vincennes and Peacock, Orn. Atlas, pl. 38, fig. 1. Idem, Baird's B. N. A. 1858, p. 912, pl. 96, fig. 1. Idem, Pr. A. N. S. Phila. 1862, p. 323. Heermann, Pac. R. R. Rep. x, 1859, Route to California, Birds, p. 76. Cooper and Suckley, Pac. R. R. Rep. xii, pt. ii, 1860, p. 285.

?? *Uria mandtii*, Lichtenstein, Verzeich, 1823, p. 88.

Uria mandtii, Reichenbach, Vollst. Naturg. Schvimvög, pl. 4, fig. 47. Gray, Genera Birds, iii, 1849, p. 644.

Uria (Grylle) mandtii, Brandt, Bull. Acad. St. Petersb. ii, 1837, p. 346.

Uria (Cephus) mandtii, Bonaparte, Tabl. Comp. Pelag. Comptes Rendus, 1856, xlii, p. 774.

Asiatic and American coasts of the North Pacific, Kamtschatka (Mus. Acad. Philada.), Russian America, Washington Territory, California (Mus. Smiths. Inst.) Breeds on the islands off the coast of California.

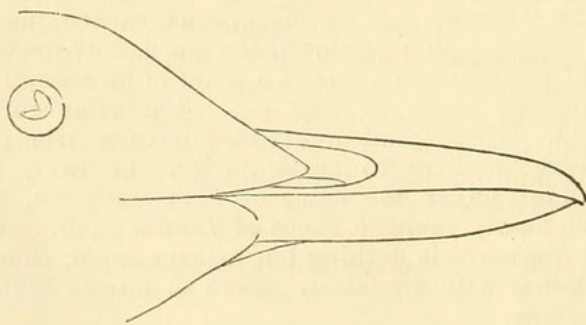


Fig. 14.—*Uria columba*.—Nat. size.

Bill stouter than that of *grylle*, more obtuse at the tip; upper mandible with the culmen straight, or even just appreciably convex, suddenly deflected; rictus straight, ascending to near the tip; gonys and outline of inferior mandibular rami straight.

Adult.—Entirely fuliginous or plumbeous black, with a shade of invisible green. White

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mirror on wing coverts. Nearly divided in two by a broad rather curved oblique line of blackish. No white on under wing coverts, these being grayish-brown. Bill and claws black. Mouth and feet vermillion red, tinged with carmine. "Iris white" (label).

Length 13.00; extent 23.00; wing 7.00; tail 2.20; tarsus 1.25; middle toe and claw 1.90, outer do. the same, inner do. 1.45; bill along culmen 1.20, along rictus 1.80, along gonys .65; depth at base .40; width .30.

This species closely resembles *U. grylle*; but differs in being upon an average larger, the wing particularly longer; the bill stouter, straighter, more obtuse at the point; and the marking of the wings different, as above described. The changes of plumage and the individual variations, as exhibited in the large series of specimens examined, and entirely parallel with those of *Uria grylle*.

It is worthy of note that this species occurs, in summer, upon the Pacific coast of America, much south of the corresponding latitudes on the Atlantic coasts frequented at this season by *U. grylle*.

One of the earliest indications, if not the first, of this species, may be recognized in the variety of the Black Guillemot from Kamtschatka, described by Pennant. This is said to have a white oblique line issuing from the white spot on the wing. The var. B of *grylle* of Latham and Donndorff is the same bird. Pallas appears to be the first to bestow a specific name. The question involved in the *Uria Mandtii*, Licht., has already been considered in the preceding article.

URIA CARBO, (Pall.) Brandt.

Cepphus carbo, Pallas, Zoog. R.-A. ii, 1811, p. 350, pl. 79. "*C. tridactylus, totus niger, orbites albis*," etc.

Uria (Grylle) carbo, Brandt, Bull. Acad. St. Petersb. ii, 1837, p. 346. "*Tota nigra, pedibus rubris, orbita et stria ab orbites pone oculos ducta albis*."

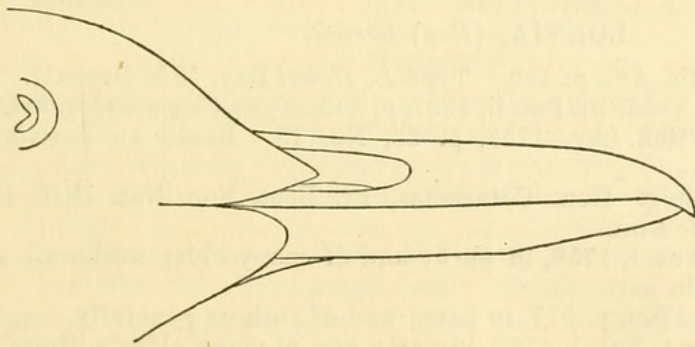
Uria (Cephus) carbo, Bonaparte, Comptes Rendus, 1856, xlii, p. 774.

Uria carbo, Gray, Genera Birds, 1849, p. 644. Cassin, Baird's B. N. A. 1858, p. 913, pl. 97. Quotes Reich. Voilst. Naturg. Aves., pl. 375, fig. 2937. Cassin, Pr. A. N. S. Philada. 1862, p. 323 (Japan).

Alca carbo, Schlegel, Urinatores Mus. Pays-Bas, livr. ix, 1867, p. 17.

"In oceano orientale circa insulas Aleuticas, præsertim Unalaschka" (Pallas), Kamtschatka (Mus. Acad. Philada.), Japan (Mus. Smiths. Inst.)

Sp. Ch.—Larger than *grylle* and *columba*; the bill especially larger, stouter and straighter. Feathers of nasal fossæ and those around base of lower mandible whitish. A



conspicuous white area around eyes, and extending an inch or so behind them. No white on either surface of wings. Rest of plumage brownish-black, becoming ashy black on the under parts; perhaps deep plumbeous black,

Fig. 15.—*Uria carbo*.—Nat. size.

with a shade of greenish, in more mature specimens than those examined. Bill black. Legs and feet chrome yellow, tinged with vermillion, webs coral red in the dried state; probably vermillion or carmine red in life.

Length 14 to 15 inches; wing 7.75; tail 2.50; culmen 1.55; commissure 2.20; from feathers on side of lower mandible to tip 1.50, tarsus 1.36; middle toe and claw 2.10, outer 2.00, inner 1.60.

1868.]

Another specimen: culmen 1.70; commissure 2.10; feathers on side of lower mandible to its tip 1.55; depth of bill at base .50; width at same point .38.

An interesting species of *Uria*, easily recognized by its peculiar colors, which are different from those of either of the other two species here described. Although unmistakeably characterized by Pallas, in 1811, as above cited, it seems to have been overlooked by many subsequent writers. It appears, however, in the monograph by Prof. Brandt, who was well acquainted with Pallas' labors and discoveries; and is on different occasions noticed by Mr. Cassin, who has given a figure of it in the Atlas accompanying Prof. Baird's Birds of North America. There is a fine specimen in the Philadelphia Academy, from Kamtschatka; and a mutilated one in the Smithsonian Institution, from Japan. The latter is interesting on account of the new and unusual locality. The bird is chiefly an inhabitant of the higher latitudes on the coasts of the Pacific Ocean. It has not yet become a common bird in collections.

The species is somewhat larger than *grylle* or *columba*, but chiefly noticeable, as far as form is concerned, by the greater stoutness and straightness of the bill, very observable upon direct comparison. The culmen and commissure are nearly straight almost to the very tip, where they are rather suddenly decurved. The gonys and mandibular rami are quite straight; the eminence at their symphysis is well-marked. The nasal fossa is short, but wide and deep; the feathers reach to the nostrils, but do not cover them. These nasal feathers, as well as those around the base of the lower mandible, are dull white. The eyes are conspicuously encircled with white, which stretches behind them for about an inch, tapering to a fine point. There are no indications of white on the wings. With the exceptions just mentioned the whole plumage is sooty-black, tinged with slaty above, with brownish below, and becoming light ashy on the under surfaces of the wings. The bill is black, as in the other species; the inside of the mouth probably carmine red in life. The feet are light yellow in the dried specimens, doubtless vermillion or carmine red in life. The webs are still tinged with this color. The claws are black.

It is possible that the plumage just described is not that of the perfectly adult bird, in which, when fully mature, the white about the sides of the head and base of the bill may not be exactly as here described; and the body colors may be purer and more intense. Dr. Schlegel describes a specimen from the Kurile islands as "d'un noir enfumé uniforme;" and another, from Sachalin island, as an "individu au plumage imparfait; d'un brun fuligineux, passant au blanchâtre sur la face et les côtés de la tête."

LOMVIA, (*Ray*) Brandt.

Lomvia, Ray, Syn. Meth. Av., p. 120. Type *L. Hoieri* Ray, (fide Bryant).

Lomvia, Brandt, Bull. Acad. St. Pet. ii, 1837, p. 345. Type *Colymbus troille* Linn.

Cataractes, Moehring, Gen. Av. 1752, p. 68, No. 75. Based on *Lomvia* Ins.

Farræ Hoieri.

Cataractes, Bryant, Monog. Gen. Cataractes, Pr. Bost. Soc. Nat. Hist. 1861.

Type *Colymbus troille* Linn.

Alca, Linnæus, Syst. Nat. i, 1758, in part; and of many older authors. Also of Schlegel (1867), in part.

Uria, Brisson, Orn. ii, 1760, p. 377, in part; and of authors generally.

Colymbus, Linnæus, Syst. Nat. i, 1766, in part; and of many older authors.

Cephus, Pallas, Zoog. R.-A. ii, 1811, p. 345, in part.

Bill shorter than the head, longer than the tarsus, straight, or slightly decurved, usually very slender, much compressed, culmen regularly decurved in its whole length, rictus moderately and very gradually decurved, gonys straight, or even slightly concave in outline, very long, nearly as long as the culmen; a groove in the side of the upper mandible near its tip; commissural edge of upper mandible greatly inflected. Nasal fossæ scarcely apparent, fully feath-

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ered, the nostrils wholly obstructed by feathers. Feathers on side of lower mandible retreating in a straight line obliquely upwards and backwards from interramal space to rictus. Wings moderately long; tail exceedingly short, the latter contained about three and two-thirds times in the length of the former from carpus to end of longest primary; tail much rounded. Tarsus much compressed, posteriorly and laterally reticulate, anteriorly scutellate, much shorter than the middle toe and claw. Outer and middle toes about equal in length; the claw of the latter much larger than that of the former; tip of inner claw reaching base of middle one. Claws compressed, moderately arched, acute, the outer one not grooved on its outer face, the middle one greatly dilated along its inner edge. A furrow in the plumage behind the eyes.

The genus as here constituted is restricted so as to comprehend only *troile* and the species intimately related. It differs from *Uria* proper in several points, some of them of decided importance. For the benefit of those who may be sceptical regarding the propriety of separating the two forms as genera, their distinctive characters are here antithetically tabulated:

URIA (<i>grylle</i>).	LOMVIA (<i>troile</i>).
Bill about equal to the tarsus; moderately compressed.	Bill much longer than the tarsus; much compressed.
Rictus straight, except just at tip.	Rictus decurved for great part of its length.
Gonys straight, half as long as culmen.	Gonys concave, nearly as long as culmen.
Upper mandible not grooved.	Upper mandible grooved near the tip.
Tomial edges of upper mandible scarcely inflected.	Tomial edges of upper mandible much inflected.
Nasal fossæ wide, deep, mostly naked; nostrils partially covered with feathers.	Nasal fossæ narrow, shallow, feathered; nostrils covered with feathers.
Feathers on side of lower mandible forming a salient rounded outline.	Feathers on side of lower mandible in a straight oblique line.
Tail short, slightly rounded, contained $2\frac{2}{3}$ times in the wing,	Tail very short, much rounded, contained $3\frac{2}{3}$ times in the wing.
Tarsus entirely reticulate.	Tarsus anteriorly scutellate.
Tarsus scarcely shorter than middle toe without claw.	Tarsus much shorter than middle toe without claw.
Outer face of outer claw grooved.	Outer face of outer claw not grooved.
Size moderate; no postocular furrow in the plumage.	Size large; a postocular furrow in the plumage.

Species—(4?).

- I. Depth of bill opposite nostrils not more than a third of the length of culmen.
 - No white on sides of head; bill slender, not dilated at base; culmen, rictus and gonys much curved..... 1. *troile*.
 - A white ring and line on sides of head; bill as in *troile* 2. *ringvia*.
 - No white on sides of head; bill stout, dilated at base; culmen, rictus and gonys nearly straight..... 3. *californica*.
- II. Depth of bill opposite nostrils more than a third of the length of culmen..... 4. *svarbag*.

LOMVIA TROILE, (Linn.) Brandt.

Lomvia Hoieri, Ray, Syn. Meth. Av., p. 120; fide Bryant.

Uria major, Ger. i, p. 549; fide Bryant.

Plautus rostro larino, Klein. Av., p. 146, No. 2; fide Bryant.

Colymbus troille, Linnæus, "Fn. Suec., ed. of 1761, No. 109." Idem, Syst. Nat. i, 1766, xii ed. p. 220; not *Uria troille*, Brünn., which is *Alca lomvia*, Linn., 1868.]

1758. Gmelin, Syst. Nat. i, pt. ii, p. 788, p. 585; quotes *lomvia* of Brünnich, No. 108. Donndorff, Beytr. Zool. ii, pt. i, 1794, p. 874; confuses the quotations of several species: *e. g.*, quotes *Uria troile*, Lath., and *Alca lomvia* of Linnæus' tenth edition.
- Uria troile*, Latham, Ind. Orn. ii, 1790, p. 796, No. 1. Retzius, Fn. Suecica, p. 149. Nilsson, Ornith. Suec. 1821, ii, p. 142. Temminck, Man. Orn. ii. 1820, p. 921. Selby, Illust. Brit. Ornith. ii, 1834, p. 420. Reinhardt, Natur. Bidrag, p. 18, No. 87. Gould, B. Eur. v, 1837, pl. 396. Fleming, Hist. Brit. Anim. p. 134. De Kay, N. Y. Zool. 1844, Birds, p. 279. Gray, Genera Birds, iii, 1849, p. 644. Naumann, Naturg. Vög. Deutsch. ix, 1847, pl. 331. Peabody, Rep. Nat. Hist. Mass. Birds, p. 399; confuses *troile* and *ringvia*. Thompson, Nat. Hist. Ireland, iii, 1851, p. 207. Macgillivray, Hist. Brit. Birds, ii, 1852, p. 318. Bryant, Pr. Bost. Soc. N. H. May, 1861, p. 74.
- Uria (Lomvia) troile*, Brandt, Bull. Acad. St. Petersb. ii, 1837, p. 345. Bonaparte, Consp. Gav. Comptes Rendus, 1856, xlii, p. 774.
- Catarractes troille*, Bryant, Monog. Genus *Cat.* in Pr. Bost. Soc. N. H. 1861, p. 6, fig. 2a. Verrill, Proc. B. S. N. H. Oct. 1862, p. 143. Idem, Proc. Essex Inst. iii, 1863, p. 160.
- Uria lomvia*, Brünnich, Orn. Bor. 1764, p. 27, No. 108; quotes *Alca lomvia*, Willoughby, t. 65. Not *Alca lomvia*, Linn., 1758. Scopoli, Bemerk. Naturg. i. 1777, p. 88, No. 108; fide Donndorff. Keyserling and Blasius, Werbelth. Europ. 1840, p. 238.
- Uria (Cataractes) lomvia*, Cassin, Baird's B. N. A. 1858, p. 913. Coues, Pr. A. N. S. Phila. Aug. 1861, p. 256. Boardman, Pr. B. S. N. H. 1862, p. 131.
- ? *Cephus lomvia*, Pallas, Zoog. R.-A. 1811, ii, p. 345; quotes *lomvia*, No. 108, of Brünnich, as ♂, and *svarbag*, No. 110, of Brünnich, as ♀; also quotes *Col. troile* of Linnæus' 12th edition. Perhaps really refers to *californicus*.
- Alca lomvia*, Schlegel, Urinatores Mus. Pays-Bas, livr. ix, 1867, p. 15. (Not of Linnæus.) Ex parte. Author considers the present and the succeeding species to be varieties of one and the same species. Describes both under same name. Quotes *Uria lomvia et svarbeg* [lege svarbag] of Brünnich; *Colymbus troile* of Linnæus; and *Uria rhingvia* [lege ringvia] of Brünnich.
- Colymbus minor*, Gmelin, S. N. i, pt. ii, 1788, p. 585; confuses three species by describing *troile*, and quoting Brünnich's No. 110 (*svarbag*) and Brünnich's No. 111 (*ringvia*). Donndorff, Beytr. Zool. ii, pt. i, p. 873; confuses three species, by quoting Latham's var. B and Brünnich's Nos. 110, 111. Author's var. γ is true *ringvia*.
- Uria minor*, Stephens, Shaw's Gen. Zool. xii, 1824, p. 246, pl. 63; erroneously quotes *svarbag*, Brünn.

European and American coasts and islands of the North Atlantic, to or beyond 80° N. On the American coast, breeds from Nova Scotia northward. "Its most favorite breeding-places south of the Straits of Belle Isle, are the Funk Islands, off the coast of Newfoundland, Bird Rock, near the Magdalen Islands, in the Gulf of St. Lawrence, and a number of small islands, generally called Murre Rocks, between Meccatina and the Esquimaux Islands, on the north shore of the Gulf," (Bryant). In winter to the extreme southern coast of New England. Specimens in all American cabinets.

Adult, summer plumage.—Head and neck all around rich dark brown, which changes on the back of the neck into dark slaty-brown, the color of the rest of the upper parts. This hue is nearly uniform, but most of the feathers of the back and rump have usually just appreciably lighter and more grayish-brown tips. Secondaries narrowly, distinctly tipped with pure white. Exposed portion of primaries dusky blackish, the shafts of the few outermost, and the greater part of the inner webs of the whole, lighter (more grayish-brown), tending to grayish-white towards the bases. Under wing coverts mostly white, variegated with dusky along the edges of the wing, and the greater coverts mostly of this latter color. Entire under parts from the throat pure white;

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the whole length of the sides under the wings streaked with dusky or slaty-brown. Bill black; mouth yellow; iris brown; legs and feet blackish.

Adult, winter plumage.—As before; the rich brown of the head darker in hue, and more like the rest of the upper parts; the white of the under parts extending to the bill, upon the sides of the head to or slightly above the level of the commissure, upon the side of the neck so far around as to leave only a narrow isthmus of dark color, which is somewhat interrupted by white mottling. The white shades gradually into the darker color, without a trenchant line of demarcation, and varies greatly in its precise outline. Usually a pretty well defined spur of dark color runs out backwards from the eye into the white of the sides of the occiput, the spur occupying the borders of the postocular furrow in the plumage. On the sides of the lower neck, just in advance of the wings, the dark color extends in a point further than it does higher up, showing the extent of the dark brown of the summer vesture.

Young, of the first winter, are colored precisely like the adults, but may be always distinguished by their much shorter and slenderer bills, which are in great part light colored (yellowish). The feet are also much tinged anteriorly with yellowish.

Fledgelings are brownish-dusky, the breast and abdomen white; and with a few dull whitish streaks upon the head and hind neck.

Dimensions.—*Adult.*—Length about 17.00; extent 30.00; wing 8.00; tail 2.25; tarsus 1.40; middle toe and claw 2.10; inner do. 1.70; outer do. 2.00; bill along culmen 1.75, along rictus 2.50; along gonys 1.15; depth at base .55; width at same point .30. Bill of young, first winter: culmen 1.50; rictus 2.25; gonys .90; depth at base .45; width at base .25.

This species is well known to vary to a certain degree in size, and in the precise shape of the bill. The dimensions above given represent very nearly the average of a large suite of specimens measured. In colors, the variations, though considerable, are unimportant, consisting in the difference in shade of the colors of the upper parts, and the difference in precise outline of the dark and light colors about the head and neck, in summer as well as in winter specimens. Specimens just before the renewal of the feathers have the upper parts distinctly barred or waved with gray, owing to the fading of the tips of the old feathers; and the wing and tail feathers light dull gray. The difference in intensity of coloration depends chiefly upon season, though individual peculiarities may be observed. Very highly plumaged birds have the upper parts almost uniform in hue.

The synonymy of this species is very extensive, and somewhat intricate, though it is possible to collate it with much accuracy and certainty, provided more labor be bestowed than the importance of the matter warrants, as seems to the writer to have been the case in the present instance. In consequence of the peculiarly obvious nature of the characters which distinguish the several closely allied species from the present one, even the brief diagnoses of the most antiquated authors may be recognized and identified, in the majority of instances. But it is curious to note that the various names most in vogue for two or three species of this genus have been so frequently interchanged, and so variously applied, not only in a specific, but in a generic, sense, that they have really come at last to mean nothing more than simply Murre or Guillemot. It is absolutely necessary to refer to a writer's description, or his authorities quoted, before we can have any idea to what species he alludes under any given name;—certainly a very discouraging state of affairs, and one not placing ornithology in a very creditable light.

The present species is Linnæus' *troille*, of Fn. Suec. 1761, and S. N. 1766, and is so regarded by most writers. It is the *lomvia* of Brünnich, which name is usually adopted by those writers who date Linnæus' prerogative of priority at 1766. It is *minor* of Gmelin, who to a description of this species adds the synonyms of two others. It is not *troille* of Brünnich, nor *lomvia* of Linnæus. 1868.]

LOMIVIA RINGVIA, (*Brünn.*) Brandt.

- Uria ringvia*, Brünnich, Orn. Bor. i, 764, p. 28, No. 111; "linea a cantho oculi exteriori per latera capitis nigrantia decurrit alba." Reinhardt, Bidrag. Naturg. p. 18. Naumann, Naturg. Vög. Deutsch. xii, 1847, p. 360, pl. 332. Keyserling and Blasius, Wirbelth. Europ. 1840, p. 238. Gray, Genera Birds, 1849, iii, p. 644. Bryant, Proc. B. S. N. H. 1861, p. 74.
- Uria (Lomvia) ringvia*, Brandt, Bull. Acad. St. Petersb. ii, 1837, p. 345. Bonaparte, Tabl. Comp. Pelagiens, Comptes Rendus, 1856, xlii, p. 774.
- Uria (Cataractes) ringvia*, Cassin, Baird's B. N. A. 1858, p. 914. Two of the specimens enumerated belong to *californica*, Bryant. Description that of true *ringvia*. Boardman, Proc. B. S. N. H. Sept. 1862, p. 131.
- Cataractes ringvia*, Bryant, Monog. Gen. Cat. in Pr. Bost. Soc. N. H. 1861, p. 8, fig. 2. Verrill, Pr. B. S. N. H. 1862, p. 143. Id., Pr. Ess. Inst. iii, 1863, p. 160.
- Uria alga*, Brünnich, Orn. Bor. 1764, p. 28, No. 112. *Ringviæ* "simillima, exceptis reatricibus totis nigris."
- Columbus langvia*, "Plaff, Reise n. Isl. p. 562;" fide Bryant.
- Colymbus troile*, var. β , Donndorff, Beytr. Zool. ii, pt. i, 1794, p. 875; quotes Brünnich's No. 112 (*alga*), and Latham's, No. 1, var. γ (also *alga*).
- Colymbus troile*, var. γ , Donndorff, Beytr. Zool. ii, pt. i, 1794, p. 876. "Colymbus annulo oculorum et linea pone oculos albis." Quotes Müller, Zool. dan. Prod. p. 19, No. 152a.
- Uria lachrymans*, La Pylaie. "Choris, Voyages Pitt. autour du monde, 23;" fide Bryant. Yarrell, Brit. Birds, iii, p. 351. Temminck, Man. iv, p. 574. Gould, B. Eur. v, 1837, pl. 397. Macgillivray, Hist. Brit. B., ii, 1852, p. 326.
- Uria leucopsis*, Brehm, "Vög. iii, p. 880."
- Uria leucophthalmos*, Faber, Isis v. Oken, 1824, p. 146. Thompson, Nat. Hist. Ireland, iii, 1851, p. 211.
- Uria troille leucophthalmus*, Faber, Prod. Isl. Orn. 1822, p. 42.
- Uria troille*, Bonaparte, Synopsis, 1828, p. 424. Two species confused. Not *Colymbus troille* Linn., nor *Uria troille* Brünn. Audubon, Orn. Biogr. 1835, iii, p. 142, pl. 218, fig. 1; oct. ed. vii, pl. 473, fig. 1. Figure 2 represents *troille*, of which the author considers the present species to be the adult. Giraud, Birds Long Island, 1844, p. 376.

American and European coasts and islands of the North Atlantic. On the American coast, breeds in the Gulf of St. Lawrence; in winter ranges south to the southern extremity of New England. Habitat the same as that of *troille*, with which it is usually found in intimate association. Spec. in Mus. Acad. Philada., Mus. Smiths. Inst., Cab. G. N. Lawrence.

Absolutely identical with *L. troille*, except in having a white ring around, and white line behind, the eye. The white ring occupies the margins of both eyelids, forming a perfect circle, posteriorly continuous with the white line which occupies the furrow in the plumage, and is an inch or more long.

The changes of plumage of this species, and the individual differences to which it is subject, are absolutely identical with those of *L. troille*. The white ring and line are usually, if not always, present in winter specimens.

The white ring and line are said to be sometimes wanting. But specimens without this character cannot be distinguished from *L. troille*.

None of the specimens contained in American museums offer any grounds for contradiction of the preceding statements.

Such being the facts in the case, each one must be allowed to determine for himself the relationship of *L. ringvia* to *L. troille*, according to the notion he may entertain of species. In forming an opinion, the facts must be borne in mind that the two kinds of Guillemots are always found intimately associated, and that they are known to copulate with each other.

It is probable that the peculiar character upon which the species rests is an individual peculiarity, not a specific difference.

This bird appears to have been first described and named by Brünnich under the designation *ringvia*. *Alga* of this author is the same bird without white

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tips to the secondaries. Subsequently several names have been proposed, as will be seen by the synonymy adduced; each based upon the head-markings. The bird has also frequently been described as *troile*, var.

LOMVIA CALIFORNICA, (Bryant,) Coues.

? *Cephus lomvia*, Pallas, Zoog. R.-A. ii, 1811, p. 345, *synon. excl.*

Uria troile, Newberry, Pacific R. R. Rep. vi, pt. iv, 1857, p. 110. Not of authors. (Coast of California)

Uria Brünnichii, Heermann, Pacific Rr. Rep. x, 1859, Route to California, Birds, p. 75; *synon. excl.* Not of authors. (Farrallone Islands.)

Catarractes californicus, Bryant, Monogr. Gen. Cat. Pr. Bost. Soc. N. H., 1861, p. 11, figs. 3 and 5. (Farrallone Islands, coast of California.)

Pacific coast of North America. Farrallone Islands, coast of California; breeding; (Mus. Smiths. Inst. and Cab. H. Bryant; the types of the species:) Sitka, Russian America; wintering; Mus. Smiths. Inst.)

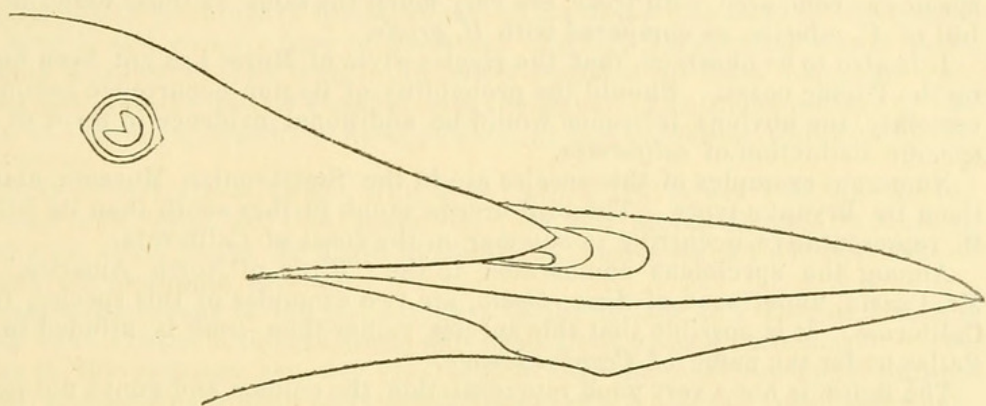


Fig. 16.—*Lomvia californica*, (Bry.) Nat. size.

(No. 17404, Mus. Smiths. A type of the species.) Entirely like *troile*, except in the form of the bill. Bill somewhat longer than that of *troile*, on an average; deeper at the base, less decurved towards the tip, the several outlines straighter. Culmen straight to near the tip, then moderately deflexed; rictus almost perfectly straight in its entire length, the commissural edge of the upper mandible toward its base somewhat expanded and everted, as in *svarbag*, though not to the same degree; the feathers on the side of the upper mandible not covering the tomial edge until very near the angula oris; gonys perfectly straight and very long, with a corresponding shortness of the mandibular rami; the angle at symphysis prominent, acute. "Iris white," (collector's label.) Length 16.00; extent 27.00, (label;) wing 8.00; tail 2.25; tarsus 1.40, middle toe and claw 2.25, outer do. 2.10, inner do. 1.70; bill along culmen 1.90, along rictus 2.90, along gonys 1.30; its depth at angle of gonys .60, its width opposite base of nostrils .35.

Winter plumage.—(No. 46522, Mus. Smiths. Sitka, Nov. 1866.) In this specimen the bill is shorter (1.75 along culmen) than in the type above described, and the culmen and rictus are more decurved. The peculiar shape, however, is still preserved, the lower mandible being deep and very prominent at the eminentia symphysis. The bird is probably one of the first winter. The plumage is entirely parallel with that of *troile* at the corresponding season. The upper parts are fully as dark as in the average of winter specimens of the latter species. The white of the under parts extends to the bill, and along the edge of the under mandible and eyes. Further back it invades the sides of the occiput and nape, where it is separated from the white of the throat by a prominent well defined spur of dark color protruding from the eye.

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As stated by Dr. Bryant, the dark parts of this species are rather paler in tint than the average of those of *troile*. But this is not a diagnostic feature, for it does not hold good in perhaps even a majority of instances. The iris, according to the label, is white; but Dr. Bryant remarks that he can hardly credit this; though if constant it would be a strong character. The only reliable diagnostic features are found in the shape of the bill, as just described. In spite of the moderate amount of individual variation to which the bill is subject, it always preserves its peculiar shape, which is sufficiently different from that of *troile* to attract attention without direct comparison of specimens. One feature which appears to have escaped Dr. Bryant's attention lies in the inflation and eversion of the basal portion of the tomia of the upper mandible, and their comparatively scanty feathering. This is an approach towards the peculiar character of *svarbag*, though by no means attaining such development as in that species. It is readily appreciable in amount in the majority of specimens.

It is worthy of note, that the peculiarities of bill which characterize this species as compared with *troile*, are very much the same as those found in the bill of *U. columba*, as compared with *U. grylle*.

It is also to be observed, that the *ringvia* style of Murre has not been found on the Pacific coast. Should the probability of its non-occurrence become a certainty, the obvious inference would be additional evidence in favor of the specific distinction of *californica*.

Numerous examples of this species are in the Smithsonian Museum, among them Dr. Bryant's types. The bird breeds much further south than its Atlantic representative, occurring in summer on the coast of California.

Among the specimens enumerated in the "Birds of North America" by Mr. Cassin, under head of *Uria ringvia*, are two examples of this species, from California. It is possible that this species rather than *troile* is alluded to by Pallas under the name of *Cephus lomvia*.

The figure is not a very good representation, the culmen and gonys not being straight enough. The under mandible, however, is well delineated.

LOMVIA SVARBAG, (*Brunn.*) *Coues*.

Alca lomvia, Linnæus, Syst. Nat. Ed. x, 1758, p. 130, No. 4. "Rostro lævi oblongo, mandibula superiore margine flavescente."

Uria lomvia, Bryant, Proc. Bost. Soc. N. H., May, 1861, p. 75. Not of authors, which is generally applied to *troille* Linn.

Cataractes lomvia, Bryant, Mon. Gen. Cat. in Pr. B. S. N. H. 1861, p. 9, figs. 1 and 4. Verrill, Proc. Essex Inst. iii, 1863, p. 160.

Uria troille, Brünnich, Orn. Bor. 1764, p. 27, No. 109. "Rostro latiore et brevior, ejus margines, etiam in exsiccatis exuviis, flavescent." Not *Colymbus troille* Linn.

Uria svarbag, Brünnich, Orn. Bor. 1764, p. 27, No. 110. Winter plumage.

Cephus arra, Pallas, Zoog. R.-A. ii, 1811, p. 347.

Uria arra, Keyserling and Blasius, Wirb. Europ. 1840, p. 237. Cassin, Pr. A. N. S. Phila. 1862, p. 324. (Northwest coast of America.) Naumann, Naturg. Vög. Deutsch. xii, 1847, p. 536, pl. 333.

Uria (Lomvia) arra, Bonaparte, Tabl. Comp. Pelag. Comptes Rendus, 1856, xlii, p. 774.

Uria (Cataractes) arra, Cassin, Baird's B. N. A., 1858, p. 914.

Ulca arra, Schlegel, Urinatores Mus. Pays-Bas, livr. ix, 1867, p. 16.

Uria Brünnichii, Sabine, Trans. Linn. Soc. xii, 1818, p. 538. Temminck, Man. Orn. 1820, ii, p. 924. Bonaparte, Synopsis, 1828, p. 424. Nuttall, Man. Orn. ii, p. 529. Temminck, Man. Orn. ii, p. 576; p. 924. Reinhardt, Natur. Bidrag. p. 18, No. 88. Yarrell, Brit. Birds, p. 348. Swainson and Richardson, F. B. A. 1831, ii, p. 477. Gould, Birds Europ. v, 1837, pl. 398. Audubon, Orn. Biog. iii, 1835, p. 336, pl. 345; oct. ed. vii, pl. 472. Peabody, Rep. Nat. Hist. Mass. Birds, 1840, p. 400. Gray, Gen. Birds, iii, 1849,

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p. 644. Thompson, Nat. Hist. Ireland, iii, 1851, p. 213. Macgillivray, Hist. Brit. Birds, ii, 1852, p. 314.

Uria (Lomvia) Brünnichii, Brandt, Bull. Acad. St. Petersb. 1837, ii, p. 345.

Uria Francsü, Leach, Trans. Linn. Soc. xii, 1818, p. 588. Stephens, Shaw's Gen. Zool. xii, 1824, p. 243, pl. 62, fig. 2. Giraud, Birds Long Island, 1844, p. 377. DeKay, New York Zoolog. Birds, 1844, p. 280. Peabody, Rep. Birds Massachusetts, p. 400.

Uria polaris, Brehm.

Coast of the North Atlantic and Pacific, and of the Arctic Seas. Herald Island, (Mus. Smiths.) In winter, on the American coast south to New Hampshire, (author's Cabinet) and New Jersey, (Mus. Acad. Philada.) Breeds in the Gulf of St. Lawrence, (Bryant.)

Form subtypical of the genus. Bill short, hardly exceeding the tarsus in length of culmen, very stout, wide and deep at the base; culmen curved in its whole length; rictus straight for about half its length, then much deflexed; gonys long, its outline decidedly concave; mandibular rami short, eminentia symphysis very prominent; tomial edges of the upper mandible in their basal half turgid, and entirely bare of feathers. Slightly larger, and rather more robustly organized than *troile*. In other respects of form identical with *troile*; the plumage and its changes also the same. The turgid portion of the tomia of the upper mandible flesh colored in life, becoming yellowish in the dried state.

Length 18.00; extent 32.00; wing 8.50; tail 2.25; tarsus 1.25, middle toe and claw 2.10, outer do. 1.90, inner do. 1.60, bill along culmen 1.40, along rictus 2.20, along gonys .90, depth at eminentia symphysis .55, width at base of nostrils .30, at angula oris .80.

The peculiar shape of the bill strongly characterizes this species. It is a rather more robust bird than *troile*, and upon an average a little larger. The colors of the plumage are not very appreciably different; perhaps slightly darker, and tending a little more decidedly towards a slaty or plumbeous hue, particularly in winter. The seasonal changes are precisely the same. The only decided difference in color lies in the whitish or yellowish hue of the expanded tomia of the upper mandible.

Brünnich's Guillemot appears to be the most boreal species of the genus, frequenting the Arctic seas, as well as more temperate latitudes. At the same time it has been found further south in winter, on the Atlantic coast of North America, than the other species; and is of frequent occurrence on the United States coast at that season. It is also of constant occurrence in the North Pacific.

This is unquestionably the *Alca lomvia* of Linnæus, 1758. The name should stand for the species, were it not now in use for the genus. It has been more usually employed for *troile*. The *troile* of Brünnich is unmistakably this species, but is preoccupied by its Linnean application for the common species. *Svarbag*, Brünnich, comes next in order. This is based upon the winter plumage, and must stand as the specific designation of the bird. Pallas named it *Cephus arra* in 1811; and Sabine redesignated it *Uria Brünnichii* in 1818. Both these names, but particularly the latter, are in very general employ at the present day. *Francsü* of Leach, 1818, also this species, has never had much of a run with writers.

List of BIRDS collected in Southern Arizona by Dr. E. Palmer; with remarks.

BY DR. ELLIOTT COUES, U. S. A.

Dr. Palmer has kindly transmitted to me a list of the birds collected by him at Camp Grant, about sixty miles east of Tucson, Arizona, during the present year. The species are identified by Prof. Baird. The collection contains four species (marked with an asterisk in the following list) not previously accre-
1868.]



Coues, Elliott. 1868. "A Monograph of the Alcidæ." *Proceedings of the Academy of Natural Sciences of Philadelphia* 20, 2-81.

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