

ground immediately surrounding it, generally looks as though bespattered with whitewash, from the excrement of the bird, which lives entirely on fish. The eggs, from four to six in number, are small, and have a thick, soft, calcareous shell, bluish-white when first laid, but soon becoming discolored. The young are hatched blind, and covered with an inky black skin. They remain for some time in the squab-condition, and are then highly esteemed for food by the northern islanders, their flesh being said to taste as well as a roasted hare's. Their first plumage is of a sombre brownish-black above, and more or less white beneath. They take two or three years to assume the fully adult dress, which is deep black, glossed above with bronze, and varied in the breeding-season with white on the cheeks and flanks, besides being adorned by filamentary feathers on the head, and further set off by a bright yellow gape. The old Cormorant looks as big as a goose, but is really much smaller; its flesh is quite uneatable." (Pt. I, p. 105, *Cormorant*.)

It will be noticed, that Mr. Ridgway says the Cormorants, speaking generally of the family, lay from *two* to *five* eggs, while Professor Newton in the above account says from *four* to *six*. When I printed my 'Comparative Oölogy of North American Birds,' I had apparently overlooked this discrepancy in the two authorities just quoted. In Professor Collett's photograph the clutches of the nests in sight are evidently three to five each, but the number in the set here may have been influenced by the birds having been so often interfered with, and their nests so frequently robbed.

CRITICAL REMARKS ON THE MEXICAN FORMS OF THE GENUS *CERTHIA*.

BY HARRY C. OBERHOLSER.

THAT there exist in Mexico two well defined races of the genus *Certhia* appears to have been first recognized by Count Hans von Berlepsch. He, in 1888, described ¹ a new subspecies of the

¹ Auk V, 1888, 450.

genus from Ciudad, Durango, northwestern Mexico, under the name *Certhia mexicana albescens*; thus restricting *mexicana* proper to Guatemala and the more southern parts of Mexico. When, some years later, Mr. Gerritt S. Miller substituted¹ the name *Certhia familiaris alticola* for the preoccupied one of *Certhia familiaris mexicana* (Gloger), he very evidently overlooked the name proposed by Berlepsch, and bestowed the subspecific designation *alticola* upon "the *Certhia* inhabiting the mountains of Guatemala, Mexico and southern Arizona (No. 726a of the A. O. U. Check-List)." Since the term *alticola* was intended to simply replace that of *mexicana*, and as it consequently may, with equal pertinence, apply to either of the Mexican forms, it seems best to retain it for the race to which Count von Berlepsch restricted the original appellation of the Mexican Creeper — *i.e.*, the bird occurring in southern Mexico and Guatemala.

The race inhabiting northwestern Mexico and Arizona will, therefore, stand as

Certhia familiaris albescens (Berlepsch).

Certhia mexicana GLOGER, "Handbuch, 1834, 381" (part).

Certhia familiaris var. *mexicana* BAIRD, BREWER & RIDGWAY, Hist. North Am. Birds, I, 1874, 128 (part).

Certhia familiaris alticola MILLER, Auk XII, April, 1895, 186 (part).

Certhia mexicana albescens BERLEPSCH, Auk V, October, 1888, 450.

CHARS. SUBSP.—*Certhia C. familiari americanæ similis, sed corpore superiore valde saturatiore, uropygio castaneo, nec fulvo, pectore abdomineque paulo canescentibus, nec pure albis, primo visu distinguenda.*

Al., 59–67 (63.8) mm.; caud., 55–64 (60.7) mm.; exp. culm., 13–15 (14.2) mm.; tars., 14–15 (14.2) mm.

HABITAT.—N. W. Mexico et Arizona.

DESCRIPTION.—Male, No. 56249, Am. Mus. Nat. Hist.; Napolera, Sonora, Mexico, Dec. 12, 1890; F. Robinette. General color above clove brown, the rump and upper tail-coverts chestnut. Superciliary stripe, spots and bars on wings, together with streaks on head, cervix and back, nearly pure white; these markings being on head rather narrow, much broader and somewhat confluent on hind neck and back. Interscapulum with a very slight admixture of the color of the rump. Outer webs of tail-feathers with little or no ochraceous suffusion. Chin and upper throat pure white

¹ Auk XII, 1895, 185.

crissum pale, tawny ochraceous, many of the feathers tipped with white; remainder of lower parts grayish white with, posteriorly, an almost inappreciable rusty tinge.

This subspecies may, by its much darker color above, be at once distinguished from any of the other forms of *Certhia* occurring in the United States, and requires comparison with only *C. familiaris alticola* from southern Mexico and Guatemala. From this it differs most tangibly in its much less rufescent tint above, the ground color of the plumage being clove brown instead of sepia; the streaks on head and back are much more clearly white and more sharply defined, and on the former somewhat larger. All the other light markings are more nearly pure white, usually lacking in a large degree the rufescent tinge seen in *alticola*. The lower parts are much lighter in color, being pure white anteriorly, and light grayish posteriorly, instead of dull rufescent gray with an admixture of rusty. The color of the rump apparently does not present a constant character, as some specimens from Arizona have this part fully as light as the Guatemala birds. The length of the bill, which was mentioned by Count von Berlepsch as diagnostic, cannot be relied upon to separate the two races, as may be seen by reference to the measurements given in the present paper.

Specimens of *albescens* from Chihuahua, Sonora, and Arizona are practically identical in coloration; but none from other localities have been examined.

Certhia familiaris alticola (Miller).

Certhia mexicana GLOGER, "Handbuch, 1834, 381" (part).

Certhia familiaris var. *mexicana* BAIRD, BREWER & RIDGWAY, Hist. North Am. Birds, I, 1874, 128 (part).

Certhia familiaris alticola MILLER, Auk XII, April, 1895, 186 (part).

CHARS. SUBSP.—*C. familiari albescenti affinis, sed capitis et nuchae striis angustioribus, corpore supra multo rufescentiori, subtus magis sordido, plus minusve ferrugineo tincto.*

Al., 58-67 (64.8) mm.; caud., 55-66 (61.2)¹ mm.; exp. culm. 12-16 (14.2) mm.; tars., 14-16 (14.7) mm.

¹ Excludes five specimens which have the tail much worn or otherwise imperfect.

HABITAT.—Mexico merid. et centr.; Guatemala.

DESCRIPTION.—No. 69835, U. S. Nat. Mus.; Volcan de Fuego, Guatemala, Nov. 18-20, 1873, 10200-12000 feet; Osbert Salvin. Ground color of the upper parts dark sepia brown, the rump and upper tail-coverts very dark tawny. Superciliary stripe, streaks on pileum, cervix and interscapular region, bars and spots on wings, white, strongly suffused with rufous. The markings on head, hind neck, and back more indistinct than in *albescens*; those of the last mentioned portion somewhat confluent. Back with much infusion of tawny and chestnut; the outer webs of the tail-feathers with an edging of ochraceous. Chin and throat white, washed with ochraceous; crissum very pale tawny ochraceous, mixed with white; remainder of lower parts dull gray, suffused and somewhat mixed with rusty.

A much richer, more fulvous tinge characterizes this race as distinguished from the preceding. The light markings upon the head and cervix are somewhat reduced both in number and size, and together with those of the interscapular region are strongly suffused with the prevailing rufescent tinge of the remainder of the plumage, being thereby rendered noticeably less conspicuous. The ochraceous or rufescent tinge below is quite marked in comparison with typical *albescens*, though the amount of rusty admixture is decidedly variable. In some specimens, however, the throat is apparently without the ochraceous tint, being nearly as pure white as in *albescens*. The bird above described is perhaps an extreme specimen, as in all of the others the dorsal streaks are more grayish, often with a slight greenish tinge.

In its most typical form this subspecies inhabits Guatemala and southern Mexico, but the birds from central Mexico should apparently be also here referred. Specimens of *Certhia* from Vera Cruz, Puebla and southern Jalisco, though approaching *albescens* in the rather lighter color of the markings on the upper parts, are much darker below, and altogether are much nearer *alticola*.

The foregoing remarks have been based upon a series of eighteen specimens; five of the form here distinguished as *Certhia familiaris albescens*, and thirteen of *Certhia f. alticola*. Although more material would of course have been desirable, yet that which is now available seems sufficient to warrant the conclusions above reached.

Acknowledgment should be made to Mr. F. M. Chapman for his kindness in permitting the writer to examine the series of

Creepers contained in the American Museum of Natural History; to Dr. C. Hart Merriam for the use of the specimens in the collection of the Department of Agriculture; and to Mr. Robert Ridgway for his courtesy in allowing similar access to the collection of the National Museum.

FURTHER REMARKS ON THE LAW WHICH UNDERLIES PROTECTIVE COLORATION.

BY ABBOTT H. THAYER.

SINCE writing my article on protective coloration in the April Auk (XIII, 1896, pp. 124-129), I have alighted on the means of still more complete ocular demonstration of the law of protective coloration.

I made some wooden eggs about the size of a Woodcock's body, and provided them with wire legs to poise them six inches above the ground.

Most of these I colored in imitation of the color-gradation of a grouse or hare; earth-color above, to pure white beneath; while to two others I gave a coat of earth-color all over, above and below; then set the whole like a flock of 'shore birds,' on the bare ground in a city lot.¹

I then summoned a naturalist and let him begin at forty or fifty yards to look for them. He saw immediately the two monochrome ones; but although told exactly where to look, failed to find any of the others, until within six or seven yards, and even then *only by knowing exactly where to look*.

I had also painted bright blue and red spots as big as a silver quarter of a dollar on the brown back of one of the graded eggs. These spots the naturalist saw, when we had come pretty near,

¹ To give the gradation its complete effect, the painting of the wooden eggs should be done after they are placed on the ground and of course by an artist.



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