

tions made during several midwinter trips to the Mt. Tallac region. Later (1911-12) he spent an entire winter at Fallen Leaf. He contributed to the Overland Monthly and Sunset.

The following species, named in Price's honor, indicate a wider field than birds and mammals in his collecting activities: two fishes, *Villarius pricei* Rutter and *Campostoma pricei* Jordan and Thoburn; a rattlesnake, *Crotalus pricei* Van Denburgh; a chipmunk, *Eutamias pricei* Allen, and a pocket mouse, *Perognathus pricei* Allen*. Dr. Grinnell writes that the Xantus Becard (*Platyptaris aglaiae albiventris*) remains known north of the Mexican line only from a specimen taken by Price or his assistants in the Huachuca Mountains, Arizona; and the Yellow-green Vireo (*Vireosylva flavoviridis*) is known from California only on the basis of a specimen taken by him near Riverside.

Price was at one time a Member of the American Ornithologists' Union and of the Cooper Ornithological Club. He was a member of the California Academy of Sciences, Sierra Club, American Historical Association, and Beta Theta Pi.

Price's service to ornithology lay not alone in his considerable collecting operations in then very imperfectly explored or unknown regions, but also in his ability to infect others with his enthusiasm and love of nature. Price was always strongly attracted by the personality of Louis Agassiz (so ably interpreted to us by Doctor Jordan), and a very real desire of his was to practice the methods of the great teacher. It was a splendid aim and focused the energies of a useful career.

Through his activities in the Sierra Nevada, he enlarged and made happier the lives of many hundreds.

Hopkins Marine Station, Pacific Grove, California, January 29, 1923.

BLACK WING TIPS

By CHARLES K. AVERILL

THE HERRING GULL, whether floating overhead, skimming over the water, or at rest, shows, as a conspicuous mark, the black wing tip. This mark is common to all our gulls, except a few Arctic species; and its persistence in so many species indicates that it is of importance in the life of the bird.

The Herring Gull moults its wing feathers in the autumn. I have before me a number of the primaries, forming the tip of the wing, that have been discarded after nearly a year's wear. Before the feather has become at all worn there is a narrow white margin at the tip. This has entirely disappeared in the specimens before me, being worn away to the black. Some of these primaries have a small, round white spot near the tip; this in the moulted specimens has nearly disappeared, being worn away. Still other gulls have a white patch near the tip extending across from front to rear margin. The margin, where white, is badly worn, leaving the black portion scarcely altered.

*To these should be added a mosquito named by Dyar.

It is noted in Bent's Life Histories of North American Birds that the white margins of the primaries of the Heermann Gull wear away wholly or partially before spring. We are forced to the conclusion that, were the wing tip entirely white, the flight of these birds would be seriously impaired.

The habit of plunging into the water when fishing no doubt contributes to the wear of the wing, and this habit is common to most gulls, as it is to terns. From reading of the habits of the Arctic gulls, which are entirely white, it appears, however, that they do little fishing, living mainly by robbing smaller gulls, and on the eggs and young of other birds. Hence they may dispense with the black or pigmented wing tip. But there is a reason of general application among birds. It is a matter of common observation that the wing motion of large birds is slower than that of small ones, and we should expect that the wear of a wing moving slowly would be less than that of one beating the air rapidly. The larger Arctic species, Glaucous and Iceland, are the ones with unpigmented wing tips, the Glaucous-winged Gull having pearly wing tips, like its mantle in color. To these must be added the Ivory Gull, an Arctic bird of medium size, entirely white in the adult plumage. This gull is one which does not plunge into the water; in fact, it is said rarely to alight on the water. Other Arctic gulls are small in size and have black wing tips.

Among terns the small size of the bird and the long pointed form of wing would call for a pigmented wing tip, aside from the fishing habit. If we look at the wing of a tern or even at some of the numerous photographs of these birds, it is apparent that the pigment is placed at the outer edge of the primaries where the most wear occurs. In the Sooty Tern the outer portion of the wing is darker than the rest.

Elisha Kent Kane, his brig fast in the ice, in latitude 78° 41', wrote in his diary June 16, 1854: "The snow-birds are the only ones in numbers, crowding our rocky islands and making our sunny night-time musical with home remembered songs." Kane heard no other song bird during his forced stay in this high latitude. The nearest competitor for Arctic honors among song birds is the Lapland Longspur, which is not credited in the A. O. U. Check-List as reaching farther north than 73° in North America, while the snowbird (*Plectrophenax nivalis nivalis*) reaches 83°. For this distinguished service in the far north, it is allowed to wear to some extent the Arctic 'color' of pure white, which the Ptarmigan and occasionally the Snowy Owl have attained. In one form, McKay's Snow Bunting, there is an advance to nearly pure white, but there is no loss of black on the outer primaries. This black is a necessity, as it is for the gull and tern; for the wing is extremely long and pointed for a bird of its kind, I think more so than that of any other of our song birds, and this form, with the extensive migration which the bird is forced to make, demands the best wearing material.

Among Arctic birds the White Gyrfalcon retains the dusky wing tip on account of its pointed wing and vigorous flight. But the Snowy Owl with its soft, easy flight and more rounded wing may dispense with the pigmented tip. The Ptarmigan, with its rounded wing not much used in flight, can also dispense with the pigmented wing tip. Indeed, finding its tail more subject to wear than its wing, it has placed the pigment where of most use.

Among the Anatidae, swans, geese, and ducks, only the swans with their great size, slow wing motion, and absence of diving habit show an entirely

white wing. Snow Geese have the black wing tip. Among ducks, white may occur on secondary wing quills, as in the White-winged Scoter, but not on the outer primaries. In any duck largely white in plumage, as the Old-squaw or the Buffle-head, the black wing primaries are conspicuous.

The Gannet, which has a rather pointed wing and plunges into the water for its food, has a conspicuous black wing tip. So, too, has the White Pelican.

Among herons, entirely white wings occur only in those of the size of the smaller Egret, and in the Little Blue Heron which is about the same size, and the much larger Egret and the Great White Heron. In these birds we have a slow wing motion, a rounded wing, and nothing especial in the habits to cause wear. The Whooping Crane and some ibises and storks show a pigmented wing tip.

Among our shore birds there are none without black or dark wing tips, and in the Avocet and Piping Plover the black outer primaries become conspicuous.

All diving birds, as auks, guillemots, loons, grebes, cormorants, are certain to have the dark wing tips, all the primaries being generally pigmented.

Albatrosses, whose wings are among the longest, have the wearing edge protected by pigment. Although the wing motion is slow, they plunge into the water and are so much on the wing that this is probably a necessity.

Tropic birds (*Phaethontidae*), flying with quick wing beats and plunging into the water, have the outer primaries black.

Black wings among North American passerine birds do not often occur and are a sign of distinction, worn by a few of long pointed wing form, as will be seen by the following list: Evening Grosbeak, White-winged Crossbill, Snow Bunting, Goldfinch, Scarlet Tanager, Rose-breasted Grosbeak, Blue Grosbeak, Indigo Bunting, Bobolink, Baltimore Oriole. All these are of good power of flight, as passerine birds go, and all but the goldfinch make a fairly long migration. If we add to the list such birds as are entirely black, ravens, crows, grackles, blackbirds, and European Starling, we shall still have only strong fliers. Swallows and swifts generally have blackish or dusky primaries instead of black, but the feathers are probably stiffened more than those of ordinary fliers.

Since the outer edges of the wing and tail feathers are more subject to wear than the inner, white markings will generally occur on the latter. It should be remembered, however, that pigment is more easily deposited where light has free access, a point apt to be overlooked by writers on protective coloration.

Special cases are those of the Towhee, which has a rounded black wing in which there is white on the outer edge, and the Magpie, which also has a rounded wing, black but with white patches on the primaries.

That black or dark portions of a feather stand wear better than white portions has long been known, but I am not aware that the disposition of pigment in such a way as to conserve the wing from wear has been noted before.

Bridgeport, Connecticut, January 16, 1923.