

taking the differences between the mean dates of arrival in years of maxima and minima of Sunspot "Numbers", thus:

Cuckoo,	Max.,	April 23.3,	and Min.,	April 15.3,	Diff.,	8.0 days.
Lark,	"	" 18.3	"	" " 13.4	"	5.4 "
Swallow,	"	" 7.7	"	" " 6.1	"	1.6 "

In considering these differences in arrivals it is, of course, impossible to estimate to what extent, if any, systematic error may be present in the records owing to the progressive change in the weather throughout the sunspot cycle and the effect this may have had on the observers' habits of observation.

It may be reasonably stated that some birds exhibit in their migratory movements relationship to the 11.5 year solar and meteorological variations. Living things like birds and trees may indeed reveal changes in the integrated conditions called the "weather" in a way that the records of meteorological elements fail to disclose. Undoubtedly the American records of 30 or 40 years' duration would be exceedingly valuable in this connection. Long series of records of the movements and numbers of birds are likely to be of great value outside of their ornithological bearing.

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A NOTE ON THE ECONOMIC STATUS OF THE BALD EAGLE IN ALASKA.

BY EDWARD D. CRABB.

ALASKA, with her 590,884 square miles, an area which equals that of Great Britain, Ireland, France, and Spain combined, and is about two and one-fourth times as large as the State of Texas; and with a resident population of 63,592 in 1900, which has probably decreased considerably by now, should be a veritable sanctuary for the Bald Eagle. For her mountain tops, cliffs, and crags are very conspicuous, and high rugged headlands fringe most of her ragged southern and southwestern coasts. These natural fortresses were formerly the homes of thousands of Bald Eagles that reared their young on jutting shelves and pin-

nacles, inaccessible to wild animals, and unmolested by man. The birds fed undisturbed from Mother Ocean's bounteous table on shell-fish, dead fish, and other lawful foods. The numerous streams furnished trout and salmon in their season; while the more level-topped headlands and protected flats supplied an occasional Grouse, Ptarmigan, or white "rabbit" to relieve the monotony of their seaborne diet.

Men in those days would consider nothing smaller, from the standpoint of its monetary value, than a whale, a fur seal, or a gold nugget. But in later years industries began to make their way along the coasts, and of these the foremost in numbers and importance were the salmon canneries. These money-mad concerns soon, by excessive netting in the streams through which the salmon must pass to their spawning grounds as well as in salt water, so seriously reduced the salmon, which is an all-year staple food for man and his dogs, that white settlers as well as Indians complained that their fishwheels, operating ceaselessly in the streams, did not catch enough salmon to supply their winter's dogfeed.

Just why many residents of Alaska as well as sportsmen in the States, should clamor for the lifeblood of Alaska's Eagles was not apparent to the writer during his stay in this Territory. But he noticed that whenever a resident was interrogated about Eagles he invariably concluded his answer by recounting the number of mountain sheep lambs, kids, fawns, domesticated foxes, salmon, and other valuable wild things that Eagles destroy annually. Whether these charges are true or not, it is interesting to the writer to recall that he did not hear a single freindly voice raised in defense of the Eagles while he was in Alaska—and what is more interesting is that only one of the birds' many accusers claimed to have witnessed it commit the serious crimes with which he charged it!

During the last two to three years the voices of eminent wild life conservators in the Eastern States have been lifted in vain against a bounty which was placed on the heads of Eagles of Alaska, in 1918. Among these W. T. Hornady has probably been the most active in pleading for "Old Baldy." He points out that the Bald Eagle is being unjustly exterminated, notwith-

standing the fact that this bird is primarily a fisherman; subsisting chiefly upon salmon which have spawned and died as well as upon other fishes which it captures alive and in no wise interferes with the activities of man.

The writer, during the late spring, summer, and early fall of 1921, observed Bald Eagles at different points along the Alaska coast from its southern extremity around the bay to near the western end of the Alaska Peninsula. Although he saw scores of Eagles in no instance did they appear other than as peaceful fisher-folk. The stomach contents of three Eagles, (*Haliaeetus leucocephalus alascanus*), which I examined contained chiefly fish bones, as follows:

A female taken at Uyak Bay, on Kodiak Island, May 5, was empty.

Another female taken near King Cove, May 25, contained the feet of a Ptarmigan and a quantity of fish bones.

The stomach of a specimen collected at Pavlof Bay, May 31, contained only fish bones.

Remains of fish were conspicuous at every nest that I visited, which contained or recently had contained young birds. One nest in particular, which contained two Eaglets and was built on the rocky headland, west of Ruby's Lagoon, at Pavlof Bay, showed no evidence of food other than fish having ever been eaten by this family. A major portion of seven "Dollie Varden" trout, ranging in length while alive from twelve to eighteen or twenty inches and still fresh, were lying on the edge of the nest. Other fish bones were plentiful; they were, I supposed for the most part, of this species; for they were comparable in size as well as in general form. Salmon, the usual source of food, had not yet begun running. No remains of either bird or mammal were found, although varying hare, Ptarmigan, many kinds of waterfowl, including flocks of Aleutian Sandpipers, which are rivaled in size only by our flocks of Blackbirds and Crows, were abundant and could easily have been caught by the parents.

After leaving the coast the writer went north from Cordova to the mouth of the Tanana river and up the Yukon to Dawson, and from there back to and up the Forty Mile River, spending three weeks in the Jack Wade and Forty Mile Country, during

July, without seeing a single Eagle! He went then on up the Yukon to old Fort Selkirk, whence he pushed some 455 miles up the Pelley and Macmillan Rivers into the country which is drained by the South Fork of the Macmillan River, in the Yukon Territory, spending twenty-nine days in this vicinity. After returning to Fort Selkirk he took passage up the Yukon to Whitehorse and embarked at Skaguay, October 12, without having seen a dozen Eagles since leaving Cordova, June 20. These observations lead one to believe that Eagles are not sufficiently numerous in the interior of Alaska to do any appreciable damage to the few settlers and the game of that part of the Territory. It is, however, probable that Eagles are more numerous in the interior during the winter and early spring, but why they would leave the open water of the coast for the frozen interior requires an explanation.

A correspondent who has had unusual opportunities to make extensive observations on the Eagles in Alaska, writes that he has observed these birds eating rabbits, Ptarmigan, Grouse, martin, fish, shellfish, and on one occasion, May, 1913, he saw an Eagle kill a pet fawn of the Alaska deer, by striking it in the small of the back.

He states that Mr. Harry Carsteene, Healy, Alaska, Supervisor of the Mount McKinley Park, is convinced that Eagles there kill the young of mountain sheep. This correspondent watched Eagles to find their nests, in the spring and summer of 1919, locating over thirty and killing the young. "There were in most every one (of these thirty nests) duck and bird feathers. In one I found a partly eaten young fox, tail of martin in another . . .

I never have examined their stomachs as they are so unsanitary I hate to touch one."

The Territorial Government of Alaska enacted an unrestricted law, in 1918, offering a bounty of fifty cents a head for Eagles, either the Golden or the Bald-headed species. In this way Alaska lost 5060 Eagles up to January 1, 1920, (W. T. Hornaday, *Natural History*, Vol. XX, No. 2, pp. 117-120) for which she paid \$2530 in bounties. I dare say that more than 1200 Eagles were killed between the southern boundary and the Chilcat Pass during the last calendar year. Bounties, however, are not collected on all of the Eagles that are killed, for most of the sea-faring folk seem to

take keen delight in shooting the birds from boats and usually leave the dead or wounded where they fall. This correspondent wrote that he killed 182 Eagles in 1919 and 327 in 1921, for the bounty—fifty cents each. Although he is convinced that he is really doing humanity a favor by killing as many Eagles as possible, I believe that the sum total of the annual damage done to Alaskans and their interests by Eagles would not cover the annual total of bounties collected for killing these birds.

I do not feel that I have collected a sufficient amount of data on Alaska Eagles to definitely determine their economic status, therefore I hope that some competent, energetic zoologist will spend several months in Alaska studying the economic phases of the Eagle problem and then recommend proper legislation. Since I found Eagles common only along the coasts, I can see no reason for placing a bounty on them throughout the entire territory. Granting that damage by Eagles is actually as great as isolated observers have noted, and as general as the bounty law would suggest, it occurs to me that a strip of country fifty miles wide along the coasts would be sufficient territory in which to apply a bounty law.

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A BREWSTER'S WARBLER AND HIS BROOD.*

BY T. DONALD CARTER AND R. H. HOWLAND.

Plate XXIV

WHILE acting as enumerators during the bird census of the Wyanokie Plateau, in northern New Jersey, on June 4, 1922, the writers discovered a male Brewster's Warbler (*Vermivora leucobronchialis*) mated with a female Golden-winged Warbler (*Vermivora chrysoptera*) and their brood of five young. Wyanokie is situated west of Midvale in north-central Passaic County. The census area of about 3000 acres consists principally of moun-

* Note on heredity of Brewster's Warbler by John T. Nichols.