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THE DUCK HAWK—(*FALCO PEREGRINUS ANATUM*) —IN IOWA.

BY B. H. BAILEY.

Few birds of the United States are more widely and generally distributed, and probably no one species is more isolated as to the individual pairs than the Duck Hawk, (*Falco peregrinus anatum*).

The Duck Hawk, Great Footed Hawk, Peregrine Falcon, etc., as he is variously called, is a "Noble Falcon," one of the really blue blooded Falconidae. Some years ago I met this species in Linn county, and the pair with which I became acquainted having been observed before and since by my friend, Mr. Geo. Burge, of Mt. Vernon, I have obtained largely from him the following facts concerning these birds. In the south-eastern part of Linn county, and extending to the north-eastern part of Johnson county, the Cedar river has cut its channel through the limestone hills of this region, and has left on either side cliffs known locally as the Palisades, raging from a few feet to nearly 100 feet in height.

On the face of these rocks grow lichens of various hues, and bushes interspersed with stunted cedar trees. In many places weathering has produced fissures and crannies which have been for years the resort of the Turkey Buzzards (*Cathartes aura*) and an occasional Gt. Horned Owl (*Bubo virginianus*). Here in 1892 Mr. Burge first noted the presence of the Duck Hawk.

The first year two pairs were seen and eggs were collected from each pair, but after 1892 only one pair returned. Before considering the nesting habits, some observations as to migration, hunting, feeding, etc., may be of interest.

The birds arrived from the south regularly in the first half of March, the 10th of this month being their earliest appearance, and staid until the latter part of September or first of October. Both birds appeared and left at the same time in the spring and fall. Their coming corresponds very nearly with the arrival of the early flights of water fowl. The hunting habits of these birds is of interest. The male bird seemed to play by far the largest part in the hunting excursions, while the female attended more strictly to household duties, remaining in the vicinity of, if not on the nest. Starting from the nest in the cliff of the Upper Palisades about 7 A. M., the male bird would fly across and up the river to the bottom lands some distance away. The flight is accomplished by short and rapid strokes of the wings, except when striking the quarry, and occasionally when sailing slowly around near the nest, which is infrequently done. Between 9 and 11 o'clock he returned and alighted in a tall oak snag almost directly across the river from the nest, calling his mate with a sounds like kak, kak, kak, repeated rapidly, starting rather low and uttered with increasing volume, the two would discuss the results of the hunt.

The early morning seemed to be the favorite time of day for hunting, and they were never seen to hunt in the vicinity of the nest. After the morning meal was eaten the birds were inclined to be rather noisy about the nest till noon, from which time till about 4 P. M., they spent the time quietly resting. The weather affected the hunt very little as the same program was carried out on rainy as well as bright days. They were never seen hunting together, and the same hunting ground was resorted to day after day.

The female was easily recognized by her greater size and her boldness when the nest was approached. At such times she would come within three feet of the intruder,

and if there were young in the nest both birds seemed furious and were very bold. On one occasion the bird was seen to take a lone Teal duck, which was following some distance behind a flock of its kind. The Falcon started in pursuit, and the little Blue winged Teal, realizing its danger, redoubled its speed and began to squawk its alarm in unmistakable notes, the Falcon flying parallel to and about a rod distant from its course of flight, with rapid beats of its wings, speedily gained a point opposite the duck and then, with astonishing swiftness, struck the Teal almost at right angles. The blow was delivered with such precision and such stunning force that the feather flew in all directions.

Mr. Burge remarked that "If the Falcon had struck the duck twice, he would certainly have had him picked." The Teal fell into the water some distance from shore, and was carried thence to their favorite snag, where the two proceeded to tear it to pieces.

The first set of eggs secured by Mr. Burge at the lower Palisades, on the 25th of April, 1892, contained four eggs varying from 2-2.96 inches to 1-98.96 inches in length, and from 1-58.96 inches to 1-64.96 inches in breadth. In color, two were uniformly spotted over the entire surface, with reddish brown on a creamy buff background; the third showed almost no background whatever, and the fourth is washed around the small end with dark lilac and coffee color.

The nest was inaccessible without a rope. Incubation was well advanced. Another set had been taken from a nest near by four days previous, on April 20th. They were also badly incubated and were destroyed, as the man who secured them did not know their value nor how to preserve them. The same man secured a second set from the nest where Mr. Burge took his first set of four, about three weeks after the laying of the first set. They were also destroyed.

In 1893 Mr. Russel Moore took a set of eggs from the highest cliff in the upper Palisades. This set was taken April 5th. The set varied in length from two inches to

1-89.96 inches, and in breadth from 1-59.96 inches to 1-63.96 inches. One egg was very heavily colored, one very lightly spotted and one was marked most heavily at the small end. The eggs were fresh, four in number, and were placed in a hole which extended four feet into the face of the cliff and was sixty feet above the water. This seemed to be their favorite nesting place, although, when persistently molested they would desert it for two other places, as will later be noted.

In no case was there to be found any nesting material carried by the birds to the nesting site. Occasionally the feather of a Flicker (*Colaptes auratus*) or Kingfisher (*Ceryle alcyon*) would be found, but the eggs were always laid on the powdered rock or pebbles in the back part of the hole.

In the same year, (1893), on May 2d, I collected a second set of three eggs in the same cliff, but placed in a niche about thirty feet above the water, and accessible by climbing from a boat below. This nesting site was used two years later by a pair of Gt. Horned Owls.

In 1894 the Duck Hawks nested in their favorite place and continued to nest there till 1897. The first set in 1894 contained four fresh eggs, April 12th, which varied in length from 1-89.96 to two inches, in breadth from 1-59.96 to 1-61.96. In this set one egg was very heavily marked, and in one the blotches were confluent about the smaller end. The other two are not peculiar.

A second set of three eggs was allowed to hatch. The birds laid almost immediately after the first set was taken and the young were about near the last of May or first of June.

On April 12, 1895, a set of five eggs was collected, which vary in color only with regard to the amount of light background showing through the deep reddish brown spots and washes. In size they vary from 1-86.96 to two in length by 1-58.96 to 1-66.96 in breadth.

About two weeks later a second set of three was taken, one of which was almost without markings, another very heavily marked with red, while the third was scarcely

three-fourths the size of a common egg of this species. This set I did not have the pleasure of seeing.

On April 8, 1896, a set of six fresh eggs was taken at the Upper Palisades. This set is peculiarly marked, having pronounced washes of reddish coffee color often at the small end of the eggs and showing a peculiar purplish lilac as a deeper ground color. One or two eggs are irregularly daubed with black at the smaller end. They vary in length from 1-78.96 to 1-94.96 inches, and in breadth from 1-47.96 to 1-56.95 inches. A second set of three eggs hatched some distance below and on the opposite side of the river from the usual nesting site. The young birds were all killed before reaching maturity.

Up to this time it had been easy to start the birds from the nest by clapping the hands or striking an oar upon the water, but now the birds having become wiser, it was only when the nest was approached very near that the old birds could be flushed.

On the 1st of May, 1897, a set of four fresh eggs was taken from the site where in 1896 the three young birds were seen. The birds seemed for some time to be considering the old site at the upper cliff, but finally decided on the lower cliff, and hence the late date of this set. There is a possibility of this being a second set, but as the birds were closely watched it is quite unlikely. One of these eggs appears as though it had been steeped in strong coffee. It is also quite pointed. Another appears as though but half immersed in the same fluid, and the others are not specially peculiar but lighter in color. They vary in length from 1-84.96 to 1-59.96 inches, and in breadth from 1-53.96 to 1-59.96 inches. No second set was taken during this year.

In 1898 the last set was taken from this pair of birds. They had returned to the old nesting site in the upper cliff and there deposited a set of six eggs, which were fresh when taken, April 6th. This set is peculiar in its contrasting colors. The background being in sharp contrast with the dark reddish splashes of color in three cases, centered at the large end and in two instances at the small end of

the egg; the sixth egg showing the lilac shell markings noticed in only a few of the eggs.

A second set was laid and three young were hatched, but were killed before reaching maturity. Shortly after this one of the old birds was shot. The remaining falcon staid until June, when it disappeared, and none of this species have since been seen in the vicinity of the Palisades.

In considering this series of observations carried on through seven consecutive years, one cannot help being impressed with the tenacity with which these birds cling to their favorite nesting locality. The variation in the eggs of this species, and especially this pair of birds, is noteworthy. From almost unmarked specimens one may find gradual variation to eggs which show almost no trace of the ground color and whose spots are in places almost black. Some show sharp contrasts, while others lack it entirely. This series of sets consists of thirty-three eggs and contains two sets of six, one of five and four sets of four eggs each. Probably nowhere in the United States is there a more complete and interesting series of sets of this particular species.

The longest egg measures 2-3.96 inches, while the shortest is 1-78.96, a difference of 21.96 inches. In breadth the variation is almost as great, the broadest being 1-66.96, the narrowest 1-47.96, a difference of 19.96 inches. The variation in number is also great, three being the smallest complete set and six the largest.

In no case where a second set was laid did the number exceed three. Unfortunately no measurement of the second set laid were secured, and this prevents us from knowing whether these eggs were smaller in size as well as fewer in number than the first sets.

The food, so far as observed, consisted entirely of birds, and at least four different species are known to have been taken. The increasing popularity of the Palisades as a summer resort, together with the presence of a large stone crusher located near the cliff where these noble birds once nested, precludes the likelihood of their return to this once favored locality.