

NOTES ON SWAINSON'S HAWK (*BUTEO SWAINSONI*)
IN MONTANA.

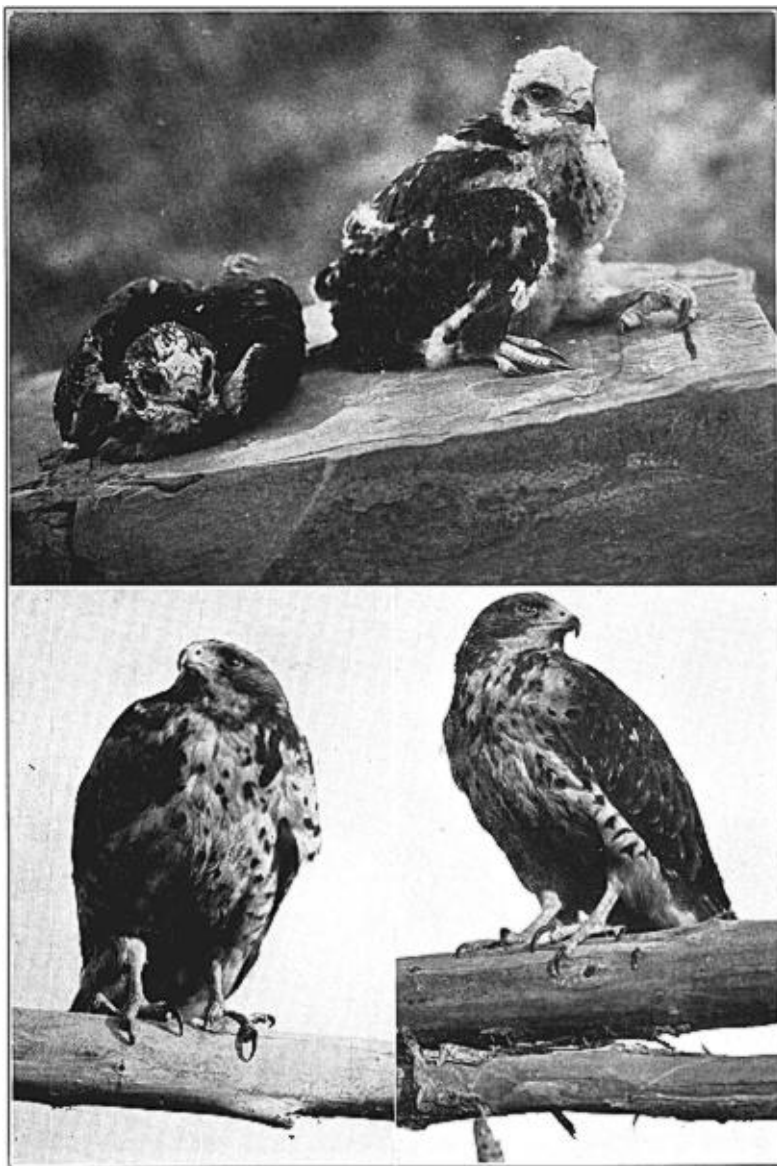
BY E. S. CAMERON.

Plates XII and XIII.

II. FOOD.

In his standard work on 'The Hawks and Owls of the United States' Dr. A. K. Fisher, gives a summary of eighteen stomachs of Swainson's Hawk examined by him as follows: "Seven contained small mammals; eight, insects; three, reptiles; three, batrachians, and three were empty." My own conclusions, from observations made at fourteen nests, are that Swainson's Buzzard prefers frogs, grasshoppers, and mice, in the order named to any other food when it can get them. Grasshoppers form the staple sustenance of these hawks in Montana. In common with all birds, however, the hawk's food habits vary with season and locality, and in spring, when its favorite prey is unobtainable, small birds and cotton-tail rabbits (*Lepus artemisiae*) are attacked. As regards the former, Lark Buntings (*Calamospiza melanocorys*), which were often exceedingly numerous around the nesting site, are, in my experience, the only species ever taken — the color and soaring habits of the males rendering them peculiarly conspicuous. 'Cotton-tails,' now very scarce owing to an epidemic amongst them, were at one time remarkably abundant, and fell frequent victims to buzzards and Great Horned Owls. One of these small hares, weighing under three pounds, which dart for their nearby holes at lightning speed upon the first alarm, was found in the nest of a Swainson's Hawk, and testified thereby to the venatorial skill of its capturer. In Alaska Mr. Dall found the bones of rabbits, squirrels and ducks in the nest of Swainson's Hawk,¹ but I have never known any prairie dogs, poultry, or game birds, to be taken by it. Constant observation was kept upon a pair of Swainson's Hawks which nested in my vicinity in 1908 and 1909 by my wife,

¹ North American Birds, Vol. III, p. 269.



SWAINSON'S HAWK (*Buteo swainsoni*).

1. Nestlings Three Weeks Old. 2. Eight Months Old. 3. One Year Old.

myself, and the herd-boy above mentioned. The young birds were fed chiefly upon grasshoppers with occasional mice, frogs, and snakes. Whenever my wife or I visited them their crops were crammed with the first named. The herd-boy, who had the best opportunities for observation, as much of his time was spent near the nesting site,—told us that the female continually brought frogs and occasionally snakes. He once saw her seize on the ground, and bear to the eyrie, a Lark Bunting which she captured by stooping from a height like a falcon. At this nest, during the two years which we observed it, the above was (so far as we knew) the only time that the young hawks were regaled with a feathered prey. Unless I actually saw the parents bring food, I could only infer its nature from the excretions and pellets, as nothing edible was ever found in the nest. This was situated upon a creek with many reed fringed, frog-haunted pools, and it was, therefore, natural that next to grasshoppers the amphibians should be the most frequent prey. The more shy male did not bring food so often as his mate (at least when intruders were present), although I once flushed him off the eggs. Swainson's Hawk is a voracious feeder, and on June 27, 1893, I shot a female of this species whose stomach contained an entire Lark Bunting. Even the unfledged young will swallow mice and frogs whole. Like its great cousin, the Golden Eagle, this hawk is very partial to snakes, but sometimes the snake proves too much for its captor, as in the following instance kindly narrated to me (in lit) by Mr. W. R. Felton — a civil engineer for the Chicago, Milwaukee and Puget Sound Railway. On August 31, 1910, his slowly moving freight wagons were winding up a trail by the Little Dry River to another camp site. The instrument man, Mr. M. H. Devine, brought up the rear about a mile behind the van, when his attention was attracted to a large hawk which fell swiftly through space to the ground apparently with a broken wing. His curiosity being excited, he at once walked towards it, but, when about sixty-five yards off the disabled hawk succeeding in rising to a considerable height. As he watched it, to his great surprise, the hawk again fell headlong, this time into the middle of the river, impelled by some mysterious agency. The bird managed to struggle to the bank, and upon being lifted from the water was found to be a Swainson's Hawk with a garter snake

(*Eutaenia sirtalis*) firmly coiled around one wing. Both hawk and snake were unfortunately killed; neither does any harm, and they are useful to destroy the ubiquitous mice. In fact the snake disgorged a partly digested mouse when withdrawn from the water. So tightly did the reptile (which measured twenty-eight inches) encircle the hawk's wing, that it could not be pulled away and had to be gradually unwound. Dr. Holland mentioned to Seebohm an instance in Pomerania of a female buzzard (*Buteo vulgaris*) which represents the American *B. swainsoni*) having been found dead on the nest with a live viper under her.¹

It has been universally considered by ornithologists that members of the subgenus *Buteo* never chase birds on the wing, but I believe all buzzards which stoop to a feathered prey will occasionally do so when driven by hunger, or incensed by the disappointment of missing the bird on the ground. The distinguished ornithologist, Coues, referring to Swainson's Hawk wrote: "Though really strong and sufficiently fierce birds I scarcely think they are smart enough to catch birds very often."² For my own part, I believe that their failure "to catch birds very often" proceeds more from disinclination than inability to do so. Where locusts, mice and frogs are exceedingly abundant, as is usually the case here, these indolent hawks which would "rather snatch stealthily than capture in open piracy"³ are reluctant to exert themselves to hunt the more agile game. I have only once myself seen a Swainson's Hawk in pursuit of a flying bird, although such a chase must not infrequently occur when the hawk is famished or ground game is scarce or absent. In this flight, at any rate, the hawk acquitted herself with considerable dash, and, so far as I know, has added a new record to the hitherto published history of the species. During August, 1909, I saw the female of the pair of Swainson's Hawks which had been under observation, and whose young had then flown, make a determined stoop at a Lark Bunting (*Calamospiza melanocorys*) on the ground. The quarry crouched under the lowest wire of a protecting fence, and there was no wind to aid the hawk which was obviously so hungry that her valor over-

¹ British Birds, Vol. 1, p. 120.

² Birds of the Northwest, 1874, p. 358.

³ Coues *op. cit.*

came her discretion. The consequence was that she just missed the bird but collided with the fence, and, losing her balance, fell over. The terrified bunting was the first to recover its wits, and justified its name by soaring straight upwards like a true lark before it flew swiftly away. To my great astonishment the flustered hawk rose in the calm air and flapped after the now distant bunting. With steady beats of her long wings she appeared to be making but slow progress, whereas, in reality, her speed was more than double that of the fugitive, and she soon overtook it. When, as it appeared to me, about a yard above her quarry, the hawk made a sudden dash to seize the bunting in her claws, which the latter cleverly evaded and then flew off in a different direction. Being assailed only by a clumsy buzzard, which could not "throw up" like a falcon, the little bird escaped rejoicing, although by a narrow margin. The entire absence of wind greatly impeded the hawk, and prevented her from sweeping up to her quarry in the first instance, while causing her to flap heavily during all the time of the pursuit, and when endeavoring to recover herself after the attack. It was clear to me that, had there been a breeze, the result would have been widely different, as Swainson's Hawk is a bird of powerful flight — in some specimens the tips of the long folded wings extending beyond the tail. Upon subsequent reflection I was not so much surprised by this valiant flight so contrary to the usual accepted estimate of *Buteo*. Field naturalists often generalize upon insufficient data, and the many misleading accounts of the Golden Eagle (*Aquila chrysaetos*) which is only a large buzzard, at once come to mind. It has often been depicted as of a cowardly nature, subsisting exclusively on carrion, or on small mammals and birds which it always seizes on the ground. As regards the charge of cowardice (if I may be pardoned a digression) no one can read the accounts of this eagle in Turkestan and Russia where it is flown at deer, antelope, wolves, and sometimes the bustard, as given by Mr. J. E. Harting in his 'Hints on the Management of Hawks' without being thrilled with admiration at the bird's prowess. Mr. Harting gives the translation of a letter (op. cit. p. 185) he received from the late Mr. Constantine Haller, President of the Russian Falcony Club at St. Petersburg, who referring to the flights of the eagle at wolves remarks: "It sometimes happens that,

if its stoop be true, it will split the skull of a fox at one blow, and its strength is such that it can easily knock over a young wolf, or a sheep. Even a Kirghiz in the saddle (so the natives say) cannot resist it if it comes at him on the wing. This unfortunately happens sometimes if the Eagle misses its prey. To fly at a wolf the largest and strongest bird is selected. It stoops again and again at the beast, eventually seizing it by the head and neck. Occasionally the wolf contrives to shake off the bird with a frantic effort, or by rolling on the ground; but if it has a good start and goes away full speed, the falconer follows on horse-back and helps his bird to kill the quarry." It is also asserted by the Kirghiz that wild eagles "will attack and kill the wolf" (p. 170).

As regards the capture of flying birds by the Golden Eagle: my brother Mr. Allan Gordon Cameron, has frequently descried an eagle on the Island of Jura, Scotland, "hawking grouse just as a peregrine will do," and, on one occasion the royal bird in full chase of a grouse passed within a few feet of his head as already related in 'The Auk.' Moreover Mr. Seton Gordon has conclusively shown that this splendid raptor easily cuts down flying ptarmigan with a blow from its wing. In Montana, a Golden Eagle has been observed to attempt the capture of a wild goose (*Branta canadensis*) from a northward-bound flock.¹

The Harrier (*Circus cyaneus*) which is not specifically distinct from the Marsh Hawk (*Circus hudsonius*) is considered the most ignoble of hawks and about the least likely to strike down a flying quarry. Nevertheless, I have myself observed the latter to chase birds on the wing, and Dr. A. K. Fisher has seen it do so "in a few instances."²

In the review of a Persian treatise on falcony translated by Colonel Phillott, we read: "Our Persian prince, however, succeeded in training one (a harrier) to take a *Chukor*, or Red-legged partridge, and on a second occasion, when in Baghdad, he wagered a valuable mare with some local sportsmen that within the space of fifty days he would reclaim a harrier, and successfully fly it at wild quarry. He flew it in the presence of his friends, and took with it a black partridge (or francolin), a quail, and a rail."³

¹ See Auk, XXV, 1908, pp. 258-259.

² Hawks and Owls of the United States, p. 28.

³ London Field, April 10, 1909.

A flight by any kind of wild eagle or hawk is rarely witnessed, even by those persons, who, by reason of a lifelong familiarity with the raptores in their haunts enjoy special opportunities for seeing it. Of the Red-tailed Buzzard (*Buteo borealis*) which in its second plumage bears a strong resemblance to a Swainson's Hawk of the same age, and does not surpass (even if it equals) the latter in flying powers, Dr. A. K. Fisher has written: "On one occasion the writer saw one of these birds stoop at a crow which had just been shot. During the descent the crow made considerable commotion, which evidently attracted the Hawk, for with a swiftness of flight that would have done credit to the Duck Hawk, it struck the crow just as it reached the ground."¹ The above is very different behavior to the usual conception of this bird.

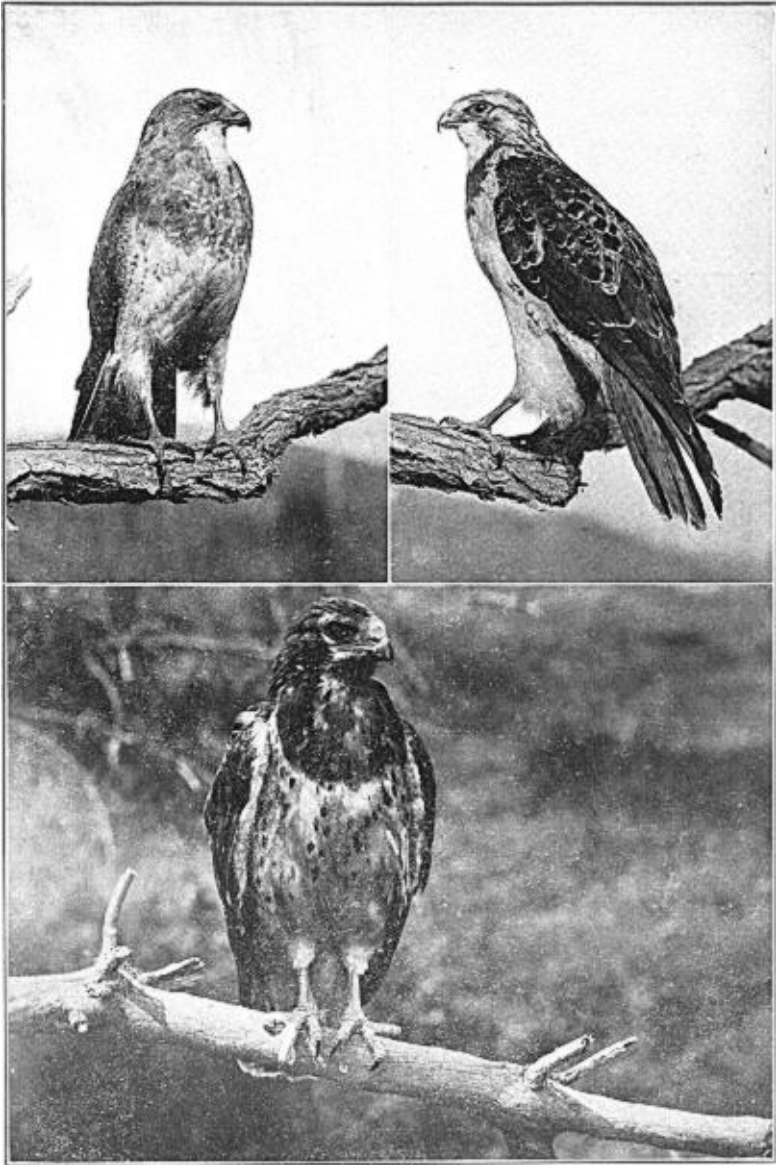
III. PLUMAGE.

The first plumage of Swainson's Hawk has been admirably described by the distinguished ornithologist, Coues and other writers. As regards the subsequent plumage changes, however, it appears to me that much confusion has arisen; nor is this to be wondered at when it is considered that immature birds, both male and female of the same age, exhibit endless differences in coloration. In an authoritative work on birds the following passage occurs: "The Buzzards have usually been placed next the Eagles, with which they have many points in common; but they differ, among other things, in assuming, it is said, the adult plumage after the first moult, whereas it takes several years for the Eagles to attain full plumage."²

While the above may possibly apply to some species of buzzards, it is certainly incorrect in the case of *Archibuteo ferrugineus*, *Buteo borealis calurus*, and *Buteo swainsoni*, all of which I have kept in domestication. To the two former I will again refer, and at present deal only with the latter. In my opinion, at least four distinct plumage changes can be traced in normal individuals of this species — in other words, the adult dress is assumed at about four and a

¹ Hawks and Owls of the United States, pp. 48-49.

² Birds of The World. Frank H. Knowlton. 1909.



SWAINSON'S HAWK (*Buteo swainsoni*).

1. Adult, Four Years Old. 2. Two Years Old. 3. One Month Old.
(1 and 2 from mounted specimens.)

half years old. To begin at the beginning: the nestlings are hatched covered with fluffy down, but at first show much pink about the head, where the down is absent.

In two weeks black feathers are mixed with the white down, and at three weeks old the birds are nearly full-feathered, their heads and breasts alone showing white. (See Pl. XII.) As at this age they are physically unable to stand up, it is impossible to obtain an artistic picture. At a month old the nestlings are full-fledged, but still occupy their nest, although the females, which are more precocious, can fly well in a wind after a few attempts. The latter may be recognized by their larger size and more spirited demeanor.

FIRST MALE PLUMAGE.

The first plumage common to both sexes is retained for a year. Until my tame hawk had finished his moult, in October, his appearance coincided exactly with the 'young of the year' so ably described by Coues as below. (See photo of hawk at eight months old.) "Entire upper parts dark brown, everywhere varied with tawny edgings of the individual feathers. Under parts, including lining of wings, nearly uniform fawn-color (pale dull yellowish-brown), thickly and sharply marked with blackish-brown. These large dark spots, for the most part circular or guttiform, crowd across the forebreast, scatter on the middle belly, enlarge to cross-bars on the flanks, become broad arrow-heads on the lower belly and tibioe, and are wanting on the throat, which is only marked with a sharp, narrow, blackish penciling along the median line. Quills brownish-black, the outer webs with an ashy shade, the inner webs toward the base grayish, paler, and marbled with white, and also showing obscure dark cross-bars; their shafts black on top, and nearly white underneath. Tail-feathers like the quills, but more decidedly shaded with ashy or slate-gray, and tipped with whitish; their numerous dark cross-bars show more plainly than those of the quills, but are not so evident as they are in the old birds."¹ The legs, feet, gape and cere are chrome yellow, the

¹ Key to North American Birds, p. 547, Ed. 1887, and Birds of the Northwest, p. 359.

claws black, and the bill slate color. The irides in the newly fledged young are blue gray which soon changes to pale hazel. Fledglings vary in the shade of yellowish-brown, amount of white, and number of spots on the under parts. The spots apparently darken with age until the moult, as my tame hawk became gradually more and more chestnut.

SECOND MALE PLUMAGE.

The moult was begun on April 9, when the bird was kept in a large specially made cage so that I could collect his feathers and observe the order of losing them. He began by shedding his quills — the inner primaries (seventh in each wing) being the first to fall out. By April 29, I had picked up five primaries and four secondaries when the hawk ceased temporarily to lose any more feathers. On May 8 he commenced to moult the feathers of the wing coverts, but as he pulled all the smallest in pieces it was impossible to keep an accurate count of these. On May 26, the new centre tail feathers were observed to be growing down above the ten old rectrices possessed by the hawk, which, however, had eleven when clean moulted. (Two other examples of the same age had eleven rectrices each). On June 8, the two old centre tail-feathers fell out, and on the 9th and 10th three more rectrices were lost. At this date the bird displayed a mixed bi-colored tail of old and new feathers when, as pointed out by Coues¹ the new tail-feathers and quills were strongly slate-colored in striking contrast to the dark brown old ones. During the three days above mentioned the hawk also lost a primary and several feathers of the wing coverts, which, as usual, he tore in fragments. On July 3 he shed another primary when he was again given his liberty. The moult extended over a period of six months, and the outer or first primaries were the last feathers to be shed, as is the case I believe with all raptors.

This tame hawk moulted into a plumage in many respects similar to that worn during the first year. With the exception of a white occiput, and nearly white "flags," the whole of the

¹ Key to North American Birds, 1887, p. 546.

head, neck and underparts became rich cream color. To be very precise, the shade exactly matched the pale side of a Graham biscuit as sold in cartons by grocers. The spots had all disappeared excepting a few arrow-heads and longitudinal bars on the upper breast, and some others on the sides which were mostly concealed by the wings. The upper parts appeared to be much lighter than before, although the ground color was only a shade less dark than the chocolate brown of the first plumage. This light effect was produced by a border of white and chestnut, or white alone, which replaced the tawny edgings to the feathers of the back and wing coverts. Some of the secondaries were pure white. The crown, sides and back of the neck were streaked with the dorsal brown. The underside of the wing was of three shades. From the wrist downwards for five inches it was the cream color of the breast, then became a silvery gray to the end of the secondaries (seven inches more), which was merged into five inches of blackish brown constituting the primary tips. The wings were thus seventeen inches long, and extended for six eighths of an inch beyond the tail — although in a wild example of the same age they exceeded it by one and one half inch. The tail feathers were all tipped with white, the upper tail coverts being also of this color, variegated with mixed brown and chestnut bars. I am fully convinced that the young bird from the Rocky Mountains (10, 761) described in *North American Birds*, Vol. III, p. 264, also *Buteo swainsoni*, var. *oxypterus* normal young plumage, p. 266-267 op. cit. of which an illustration is given, are both examples of Swainson's Hawk in the second plumage. In fact, the description of the young female var. *oxypterus* (33508) p. 367, would fit my tame bird after moulting with but slight alteration. As the spots of the underparts may or may not persist in the second plumage, they are not to be relied upon as an indication of age.

I may here remark that my Swainson's Hawk in second plumage bore a striking resemblance to a Western Red-tail of the same age (three of which I reared from two different nests) when both were seen from behind. The only points of difference were in the brown tail and much shorter wings of the Red-tail, which undoubtedly has four parallel plumage changes to *B. swainsoni* before becoming adult.

THIRD MALE PLUMAGE.

My hawk was unfortunately lost in 1910, which prevents me from proving absolutely from a captive specimen that the following conclusions regarding the third dress assumed, are correct. Nevertheless, I believe that I can present a fairly accurate account of the subsequent plumage changes in this species, based upon a study of thirty skins and hundreds of wild birds. It must always be recollected that, as some individuals differ remarkably in plumage from the congeners of the same age, allowance has to be made for these dissimilarities. For example, in both sexes the chief second plumage variation consists, apparently in the retention or extinction of the spots on the underparts which form so conspicuous a feature in all birds of the year. In the third male plumage the whole of the upper parts are light umber brown with the head of a darker shade. Many feathers of the back and scapulars are chestnut-edged, but the white margins of the second plumage have disappeared. The primaries are brownish-black above becoming ashy, or pale slate, towards their bases on the inner webs, and slate color beneath, gradually blackening near the tips. The entire upper breast is bright cinnamon with a purplish bloom, and it is in this plumage that the white throat first appears, in strong contrast to the cinnamon upper breast and sooty brown head. In three examples before me this white patch measures two and a half inches long by one and a half inches wide. The ventral surface and lining of the wings are buffy white, slightly flecked or broadly splashed (according to the specimen) with a paler tint of the breast color. The newly-grown light slate tail-feathers have eight dark bars, and are a still paler shade of slate below, but fade to brown before the next moult on the exposed parts. The two upper rectrices always turn more or less brown except at their bases which are protected by the secondaries in the folded wing. If the former are raised, the original slate-colored tail is disclosed.

FOURTH MALE PLUMAGE.

In the fourth male plumage which resembles the third, and bears the same relation to it as the second does to the first, the bird becomes lighter everywhere. The whole of the underparts are white, and the broad cinnamon band of the upper breast is reduced to a narrower one of white-spotted chestnut, against which the immaculate white throat is less sharply defined than in the third plumage. The head is smoke color, or ashy, the occiput white, and the upper parts always, in my experience, either pale buffy brown, brownish ash, or bluish ash, but never dark brown as described by some ornithologists.

In Fisher's 'Hawks and Owls of the United States,' p. 78, 1893, Knight's 'Birds of Maine' (p. 230, 1908), and Knowlton's 'Birds of The World' (p. 257, 1909), one plumage phase of the normal adult male is, in my opinion, correctly given as "grayish brown," but no reference is made in ornithological works to the other color forms of bluish ash and buffy brown. Dr. Jonathan Dwight, Jr. was good enough to comment on a paper of mine on the plumage of *B. swainsoni* published in 'The Auk' (Vol. XXV, p. 468), remarking in 'Bird Lore' (Vol. X, p. 267): "The gray birds may change to brown through wear just as the loss of the "frosting" of some Terns' feathers produces blacker wings." I have myself come to the conclusion that this is probably what occurs, and that from the effects of wear and light on the feathers the ash colored birds become browner. I am the more inclined to adopt this view because, as above mentioned, in all specimens examined by me the tail has faded to brownish whenever exposed to weather or light, while its covered portions retain their pristine ash or slate-color untarnished. Otherwise the three color forms of buffy brown, bluish ash, and brownish ash can only be explained by dimorphism. As Swainson's Hawk is so widely distributed in its breeding range, which extends from Alaska to Chile, normal adults from different localities might easily differ in the color of the mantle. The discoveries of Dr. J. A. Allen on the relations between locality and coloration in American animals, from North to South, will at once come to mind, as his remarks have been freely quoted by most naturalists. He

found "a decrease of intensity of colour with a decrease of humidity, the paleness evidently resulting from exposure and the blanching effect of intense sunlight, and a dry, often intensely heated atmosphere." The same phenomena were observed in birds, on passing from East to West, "the darker representatives of any species occurring where the annual rainfall is greatest, and palest where it is least." Thus, strong sunlight has a bleaching effect, while a humid atmosphere causes intensity of pigmentation.¹

With regard to the melanistic form of this hawk, Dr. A. K. Fisher states (op. cit.): "From the above (grayish brown) there are all phases of plumage to a uniform sooty brown"; and, in the buzzard first observed by me in April, 1890, on the Powder River (Auk, Vol. XXIV, p. 262) numbers of melanistic individuals were present. In one day I beheld more of the latter than I have seen in the last twenty-two years of the Western Red-tail (*Buteo borealis calurus*) which is reputed to have a strong tendency to melanism; but I have not met with flocks of the Red-tail like those of Swainson's Hawk.² To sum up I consider that normal male members of Swainson's Hawk have two dark and two light plumages before becoming adult. According to my observations the bird does not breed until the fourth year, or until after it has assumed the first light plumage.

FEMALE PLUMAGE.

As previously narrated, the female of my pair of Swainson's Hawks escaped, and could not be captured, even with the aid of a pony. I am thus unable to prove the following conclusions from a captive specimen. In my opinion, the female has at least four distinct plumages parallel with the male (two dark and two lighter) and, like him, does not become fully adult until nearly five years old. The two first plumages are indistinguishable from those of

¹ Compare 'A History of Birds' by W. P. Pycraft, p. 83, 1910.

² Melanotic examples of the Red-tailed Hawk may be seen here in the striking plumage of chocolate-colored body and chestnut tail barred with black. In two specimens before me the tail of one of these hawks has eight and of the other twelve bars. I have never myself seen a black Swainson's Hawk with a noticeably light-colored tail.

the male, and the second plumage corresponds to the description of a young female, No. 33,508 in *North American Birds*, Vol. III, p. 267, as before mentioned. Always darker than the adult male, the two light normal female plumages coincide with his in the pattern changes of the underparts, which, although differing in color, show the same gradual diminution of the brown or chestnut pectoral area and the whitening of the ventral surface. I agree with Coues when he states that in the female "changes of plumage with age affect chiefly the underparts; the back, wings, and tail are more nearly alike at all times."¹

THIRD FEMALE PLUMAGE.

In this plumage the female Swainson's Hawk assumes the white throat, and, according to my observations, first begins to breed — that is in her fourth year. She has now the appearance of a plain brown and white bird. Her upper parts are precisely similar to the third male plumage (light umber brown) except that the chestnut edging to the feathers of the mantle is absent in the female. There are some bright chestnut lateral feathers concealed by the wings, and a trace of this color on the thighs and abdomen. The white ground of the latter is thickly variegated with wavy cross-bars of the color of the back, and some lateral feathers near the thighs are entirely brown. The large pectoral patch conforms in extent to that of the third male plumage, but in color exactly matches the back. The new primaries and tail feathers are slate colored but fade to dark brown before the next moult while the underside of the former is pale slate, blackening at the tips.

FOURTH FEMALE PLUMAGE.

In this the upper parts are unchanged. The hawk whitens considerably beneath, the pectoral patch is smaller, as in the equal-aged male, and becomes mahogany color in place of brown. The abdomen is thickly marked with triangular spots and cross-

¹ Key to *North American Birds*, p. 547, Ed. 1887.

bars of the former hue or even chestnut in some examples. The tibioe are pale chestnut. Adult females are met with nearly as light-colored beneath as some third plumage males, and for a long time I was greatly perplexed by them — being reluctant to shoot specimens on account of their exceeding tameness.

The passage in Coues describing the adult female (op. cit., p. 547): "throat pure white but other underparts probably never whitening decidedly" led me to suppose that these might be males despite the fact that they were incubating. Having at length watched the mother of my tame hawks (which was of this light type) lay an egg, all my doubts were removed.

A SUCCESSFUL PAIR OF ROBINS.¹

BY WINSOR M. TYLER, M. D.

THE following notes, taken for the most part while I had the birds under my eye, tell the story, as I saw it, of a pair of Robins (*Planesticus migratorius migratorius*) who successfully reared two broods of young from the same nest between April 26, 1912, when the nest was begun, and July 8, 1912, when the second brood was fledged.

I am sorry that I was able to watch the birds very little during the rearing of their first brood. After the completion of the nest, my notes give merely the dates of incubation, hatching and fledging. They make no reference to the feeding of the young and none to the disposal of excrement. I regret especially the latter omission, for, if we knew how generally the excrement was eaten early in the season, we might, by comparing the later behavior in this respect, get a hint of the extent that the excrement is used to satisfy hunger. In early July, when the female parent was feeding her second brood, her feathers showed much wear and she appeared emaciated. At this time, she almost invariably ate all the excrement that the

¹ Read before the Nuttall Ornithological Club, Feb. 17, 1913.