Putumayo and the Napo Rivers." Under date of May 23, 1944, the report states that the birds were taken "some six months ago" which would mean the last of November or the first part of December, 1943. The banding data for this series are as follows:

Band No.	*Locality of Banding*	*Date*	*Bander*
38-87399	Ont., Kingston	5/19/40	R. W. Smith
38-169645	Ga., Macon	9/17/39	R. J. Fleetwood
37-108787	Ala., Opelika	10/ 3/36	H. S. Peters
139-36718	Conn., New Haven	5/24/40	H. L. Hutchins
239-12620	Ill., Lake Forest	8/ 8/39	P. E. Downing
39-71442	Tenn., Nashville	8/31/38	J. B. Calhoun
39-83055	Tenn., Nashville	9/ 5/38	J. B. Calhoun
38-21419	Tenn., Memphis	10/ 4/37	B. B. Coffey, Jr.
39-95532	Tenn., Memphis	9/21/38	B. B. Coffey, Jr.
39-96804	Tenn., Memphis	9/21/38	B. B. Coffey, Jr.
40-82881	Tenn., Memphis	10/13/40	B. B. Coffey, Jr.
40-57724	Tenn., Memphis	10/ 8/39	B. B. Coffey, Jr.
140-44267	Tenn., Nashville	10/13/40	Mrs. F. C. Laskey

According to the latest map available to me (Nat. Geog. Soc., Oct., 1942), the Putumayo River, except at its lowest end, forms the boundary between Peru and Colombia. It is a tributary of the Solimoes, the largest southern branch of the Amazon. The Napo follows a roughly parallel course through northern Peru about 100 miles to the southwest and the Yanayaco is apparently one of two small unnamed (on my maps) streams, both tributary to the Napo and entirely in Peru. This region is roughly one thousand miles air-line west of Manaus, Brazil, the site of the observations by Mr. Gilliard (See map).[1]

Fish and Wildlife Service
Washington, D. C.

A SURVEY OF THE PRAIRIE FALCON IN COLORADO

BY HAROLD WEBSTER, JR.

Plate 27

THE Prairie Falcon (*Falco mexicanus*) ranges throughout Colorado, showing a marked preference for the lower foothills wherein to nest and raise its young. Some rather warm-blooded individuals have been recorded in this state nesting as high as 10,000 feet, but I am sure

[1] The Yanayacu, as it is shown on Peruvian maps, is an affluent of the Napo from the north, emptying into the larger river about 75 miles from its mouth and some 40 miles due north from Iquitos. It is a little west of the point shown on Mr. Lincoln's map.—ED.

such an occurrence is rare indeed. It is uncommon to see wandering individuals as high as 11,000 or 12,000 feet during the summer months.

When choosing a suitable nesting site, these noble birds make sure of ample open ground over which to hunt. Those individuals that nest deep in the mountains make their homes in the tall cliffs overlooking wide mountain valleys or on the sides of the many mesas or table-mountains covering southern and western Colorado. They nest without fail on tall, inaccessible bluffs or escarpments, usually choosing a ledge overhung by large sections of rock, making observations rather difficult for the curious ornithologist. These cliffs range from 30 to 300 feet high, and many of them can be reached only with a stout rope and plenty of stamina. There are other eyries situated on cliffs of the Colorado River Canyon whose sides tower more than 1,500 feet and, at present, are in no immediate fear of disturbance by curious humans.

I have recently estimated the total nesting population of the Prairie Falcon in Colorado as comprising, conservatively, 500 nesting pairs. I have visited 135 eyries in the last five or six years and have centered my rather limited 'birding' in three small sections of the state. The southern section centers about Colorado Springs and El Paso County, the middle section about Denver and the adjoining towns, and the northern section in the chalk cliffs along the Colorado-Wyoming boundary line. Mr. Floyd Ballanger of Palmer Lake, Colorado, has told me of at least eighty pairs of nesting Prairie Falcons which I have never visited. It is safe to say that every cliff conveniently situated near good hunting ground will have a pair of these desert falcons. In some rather densely populated sections it is not unusual to find two pairs nesting within three or four hundred yards of each other, and in one instance we counted twenty-three pairs in sixteen miles of cliff, making the most heavily populated breeding ground of this falcon known today.

I have been asked many times about the possibility of nesting Duck Hawks in Colorado. All of the recorded eyries previously inhabited by the Duck Hawks are now occupied by the Prairie Falcon and not deserted as one might suspect. Several competent ornithologists have seen both the young and the adult Duck Hawks in June and July, but no signs of any eyrie have been found despite great efforts. It is difficult, indeed, to find the eyrie of any bird in some of the very deep gorges which could easily hide a dozen birds without the possibility of detection. It can be surmised that the Duck Hawk has been crowded out by the Prairie Falcon as a resident breeding

bird. It is not at all uncommon to see twenty or thirty Duck Hawks during the fall and spring migrations in Colorado, but they disappear during the breeding season.

A great deal has been said in recent years by conservation officials concerning the possibility of extinction of the Prairie Falcon. I honestly think that this falcon is holding its own despite a very noticeable decrease in all other species of birds of prey, especially the Buteos. No eyrie known to me has remained over one season without occupants. In many cases, each pair of nesting falcons may have two or sometimes three nesting ledges which they use in alternate years, but all of them are within a comparatively short distance from one another. Many times one of the adult birds will be shot or fall victim to some tragedy, but it is soon replaced by another bird. If the pair is broken up early in the nesting cycle, the replacement of a mate is soon forthcoming, but if a pair is broken up late in the year, it is usually not until the following year that the pair is again complete.

Apparently, Prairie Falcons start nesting before they are a year old, since we have noticed certain mated birds which have not as yet acquired certain adult characteristics—namely, the yellow cere and feet. I have yet to see a juvenile male about the ledge as one of a mated pair, but it is a known fact that juvenile females are capable of raising and do raise, a healthy family.

We are very uncertain about the migration of the members of the falcon family; some authorities give proof of an east-west migration while others maintain that a north-south route is followed. I believe, however, that there is little or no migration by our local falcons, although the birds that live deep in the mountains come down to the prairie to winter. One beautiful immature female which I trained in falconry was lost late in October, 1938, at Denver, Colorado (alt. 5,280 feet) and was shot several days after Christmas of the same year at an altitude of over 9,000 feet in one of our large mountain valleys. No doubt she had found the wintering ground of a rather large group of birds and had successfully thrived on them up until the time that she met her unfortunate end. I have never seen Prairie Falcons this high during the winter months since the snow and bad weather usually drive out all bird life, making existence rather difficult for a bird noted for feeding on the fat of the land.

Another interesting feature of the migration of the Prairie Falcon on which I am trying to get more information is the presence of very dark individuals that might possibly belong to a separable subspecies. These individuals are easily told from the local birds in the field by

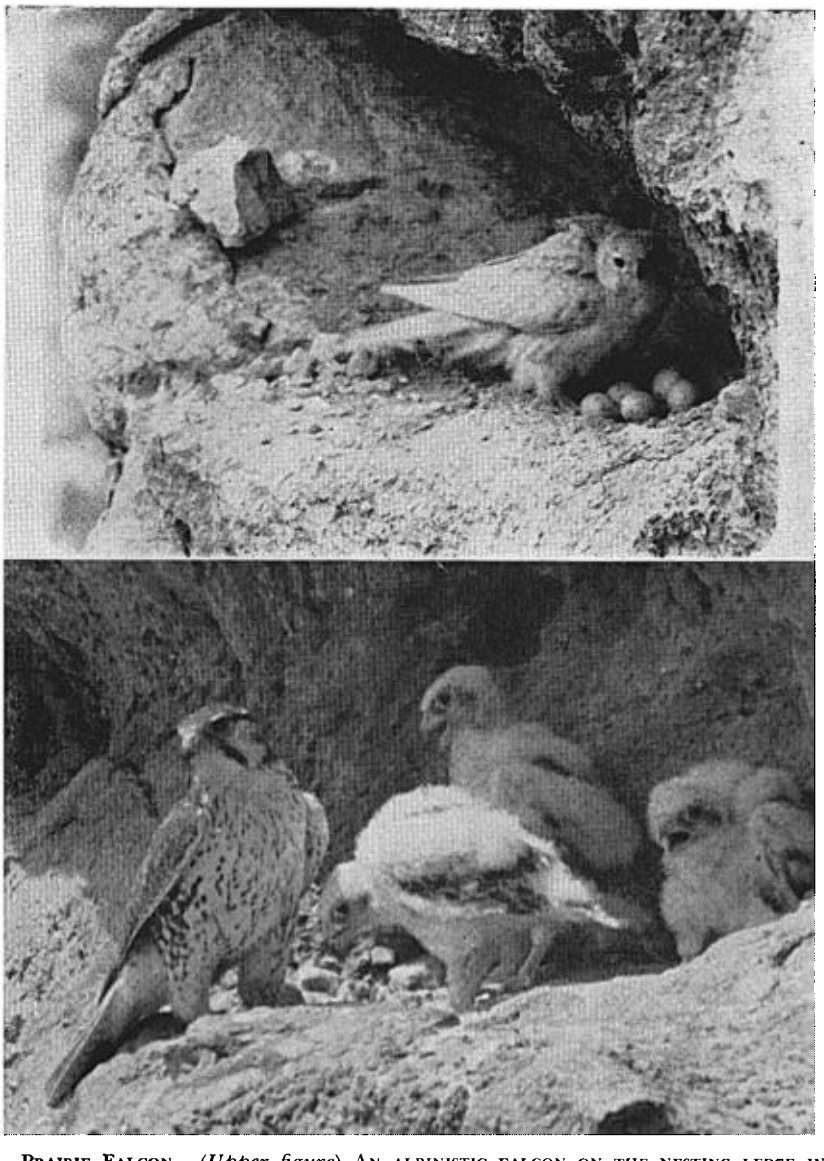
very dark chest markings such as are usually seen only on the immature Peregrine Falcons. They have a very prominent cheek marking and the back is more heavily marked, making the birds almost impossible to distinguish from young Duck Hawks. I suspect that these birds are of more northern origin because of their appearance only during the migrations of fall and spring.

Certain pairs of local falcons can be seen at almost any time of the year within a short distance of their eyries. I have tried to show by the use of colored leg bands which birds remain close to the eyries during the winter months and which do the wandering, but observations have revealed almost nothing. However, certain individual birds with noticeable characteristics, such as missing and discolored feathers or peculiar styles of flight, have helped greatly in identifying local wintering falcons.

I have found that the adult male is first to arrive at the nesting site in early spring. He usually precedes the female by a week or ten days, but, when one of the pair that nested there the previous year has been killed, there is usually a lapse of two weeks or more before a complete pair is in occupation of the nesting ledge. In the southern and middle sections of the state, a complete pair is at the cliff on or before the 15th of March and often a little earlier, depending greatly on the weather. If the winter has been mild, the birds will be at the ledge three or four weeks ahead of schedule, ready to begin the task of raising a brood of hungry young.

After a rather spectacular period of courtship lasting about one month, the eggs are laid on the bare cliff ledge which shows no more signs of housekeeping than a shallow hole scooped in the sand. Most ornithologists give the period of incubation as 27 to 30 days, but we have found it to be 31–33 days, although there are several instances in Weld County of a set of five eggs that was incubated for 37 days. Possibly this nest had been visited by an 'egger,' resulting in this long period.

About 95 per cent of the young birds hatched in the southern and middle sections of the state leave the eyrie safely, but in the northern section of the state only about 35 per cent of the young survive the first month. Somehow a certain tick with which I am unfamiliar has succeeded in getting a good foothold and is killing off a goodly number of the young falcons. This tick has been identified by the United States Fish and Wildlife Service as common to ground squirrels and spermophiles and here, no doubt, is the carrier of death to many young falcons. I was greatly surprised to see that, in eyrie after eyrie, the



PRAIRIE FALCON.—(*Upper figure*) AN ALBINISTIC FALCON ON THE NESTING LEDGE IN WELD COUNTY, COLORADO. (*Lower figure*) HUNGRY YOUNG WAITING TO BE FED AT THE EYRIE IN JEFFERSON COUNTY, COLORADO. (*Photographs by A. M. Bailey and Robert Niedrach.*)

young were so miserably weak that they could no longer eat, much less attempt to leave the nest after their usual stay of five weeks. Adult birds taken late in the nesting season are entirely free from the tick, but the unfortunate young are so infested that the ticks can be scraped off the nares and lores in great quantities. Very often, out of five young birds hatched in a single eyrie, only one will be able to leave well enough to take care of itself.

The greatest mortality among young falcons that successfully leave the eyrie takes place within six weeks. This has been shown by our banding records and accounted for by the fact that they have no fear of man nor gun and can be easily approached by so-called 'vermin' hunters. However, to approach the sly, old, adult falcon is, indeed, another matter.

Another rather unusual detail that we have found relative to the Prairie Falcon is a very abrupt change from a diet of rodents to one exclusively of birds about the time that the young falcons are hatched and beginning to show their ravenous appetites. On examination of the food pellets or castings, it has become a noticeable fact that can be explained only vaguely. When the rodents are mating during the spring and are most conspicuous, they fall easy victims to the falcon which, no doubt, is looking for the easiest way of getting its dinner. Later, when the young of the small birds are on the wing and rather awkward, their great numbers probably make it much easier for the falcon to provide for its young. By this time, also, the rodents are spending much less of their time in ways that make them conspicuous.

Probably the most common form of bird life preyed upon by the Prairie Falcon is the Western Meadowlark, with the Mourning Dove running a close second. The Prairie Horned Lark, Lark Bunting, Rock Pigeon, Magpie, and even the Burrowing Owl make up the remainder of the feathered menu. The thirteen-lined spermophile makes up the main portion of the rodent diet.

In comparison to a Duck Hawk, the Prairie Falcon has a much smaller appetite, eating about one-fourth to one-half as much during the course of a year. The Prairie Falcon is able to go without food for rather long periods of time and is well satisfied to feed rather heavily four or five times during the week. In falconry it is difficult to condition some of these birds because of their seeming lack of any appreciable appetite. It is true that some individuals feed on birds the year round while others are completely satisfied with a diet of rodents when and where they can be found. I think that this depends largely upon the type of country over which the falcons hunt and

on the type of animal life present. One particular eyrie in northern Colorado appears at various times to look as if someone had thrown a yellow cloak over it, due to the great abundance of meadowlark feathers about. During the winter months I have seen the falcons feeding rather exclusively upon small birds such as horned larks, blackbirds and various sparrows, with an occasional taste of waterfowl. I have in mind a particular eyrie occupied by a pair of falcons which have tasted fancy, racing, homing pigeons many times and feed almost exclusively upon the pigeons which live near-by in the rocky escarpment.

The presence of juvenile birds about the old eyries mystified us greatly. One particular eyrie west of Denver is visited every year by the juvenile birds of the previous year and, were it not for a bit of albinism in the juveniles, it would be difficult, indeed, to be sure that they were from this particular eyrie. The juvenile birds are driven away late in the courtship period after making repeated attempts to imitate the strutting and graceful flying of the adult male. These young birds can easily be told from the adults by the absence of several wing feathers, due to their molt which is several months ahead of that of the adult birds, and by the lack of color in the feet and cere. To observers who are trying to pick out the adults from the immature falcons, all flying about in a seemingly endless maze on a windy March morning, it is indeed a boon to have such characteristic differences.

I have taken a particular interest in many recent articles written on the relative speeds of various birds, and it seems strange that the Prairie Falcon is listed at a mere 60 miles per hour. I have, on occasion, seen the amazing feat of a small Prairie Falcon taking White-throated Swifts and Violet-green Swallows which are considered by most ornithologists as very fast and 'shifty.' In each instance the little male or tiercel succeeded in getting the swifts to follow it high up in the air and, after a bit of maneuvering, got a chance at the victim in a down-wind stoop. This chase was most uninteresting since it was over in the wink of an eye and did not give half the thrill that the pursuit of a fast teal or Mallard might have given on a cold December morning with the watery refuge of the duck only a short distance away. On various occasions we have seen one of these swift falcons fly into a small flock of shorebirds and come out with an unfortunate victim clutched tightly in its large, yellow foot.

Probably the most spectacular kill that I have ever witnessed took place over a tall escarpment. As we approached this particular cliff the old female falcon rose high into the air and screamed at us very

indignantly for trespassing upon her domain. She soon towered high above us and, in a long down-wind stoop, vanished from view. We were in a hurry to leave the vicinity lest we cause the brown-splotched eggs to become cold, and hastened away from the cliff, leaving the eyrie in peace. About 75 feet south of the falcon's eyrie was a small pothole in the cliff containing the nest of an old Montana Great Horned Owl which had nested near her fast-flying neighbor for more than five years. We approached her nest very cautiously and, when all were in a position to watch her leave, we flushed the old owl off the nest. The old bird headed across a small open section to seek shelter in a grove of scrub oaks about 100 yards away, but when she reached the middle of the open area she seemed to explode in midair and drop lifeless to the ground. The old falcon had come up and dealt a lightning blow that immediately put an end to the career of the owl. The apparent ease with which the falcon had dispatched the owl urged us further to examine the bird which we found quite dead and torn open as if it had been given a tap with a sharp cleaver.

Being rather interested in falconry and in the best hawking country in North America, I have had numerous letters asking about a comparison between the flying powers of the Prairie Falcon and the Duck Hawk. Each has its own mode of hunting and each is best adapted to its own particular way of obtaining food. The Prairie Falcon is much less heavily built than a Duck Hawk of the same body-length and wing-measurement. The Prairie Falcon catches its quarry while flying only about twenty to thirty feet above ground before the unfortunate victim has a chance to gain the nearest cover. The Duck Hawk, on the other hand, 'waiting on' at a tremendous height, catches its supper when the unfortunate bird is well away from the ground and carries off its kill to be eaten at leisure.

I have found the Prairie Falcon to be much more agile on the wing than the Duck Hawk, but, for speed and swiftness, the comparative lack of weight appears to keep the Prairie Falcon from attaining the tremendous velocity for which the Duck Hawk is everywhere known. With the added weight of one-sixth to one-third more for birds of equal wing- and body-lengths, the Duck Hawk is able to deliver a back-breaking blow while the Prairie Falcon often has to clutch its victim, killing it with a powerful grip instead of dispatching the victim with one clean, quick blow.

As to the temperaments of the two falcons, one of the most disagreeable features of the Prairie Falcon is a vile and unpredictable temper. One day a falcon is as calm as can be and the next day, wilder than

a hurricane. I have long since stopped trying to predict the 'nature of the day' with a Prairie Falcon and take each day in its stride. On the other hand, the gracious and lovable nature of the Duck Hawk is something to admire. Another rather unusual fact is that near the nest a Prairie Falcon lacks the boldness of the Duck Hawk which is well known for its efforts to thwart man's attempts to ruin its nest. I know of only one instance when a Prairie Falcon actually struck an intruder, but many times when they have come close enough for me to see the fire in their black eyes.

1937 Grape St.
Denver, Colorado

IN MEMORIAM—CARL EDUARD HELLMAYR

BY JOHN T. ZIMMER

Plate 28

CARL EDUARD HELLMAYR, Honorary Fellow of the American Ornithologists' Union, died in Orselina, Switzerland, on February 24, 1944. By his death, ornithology lost one of its notable figures and its most outstanding student of Neotropical birds.

Hellmayr was born on January 29, 1878, in the neighborhood of Vienna, possibly in the suburb of Mödling where some of his early papers were written. There is little on record concerning his early life, but he must have become interested in birds while still a boy, for his second publication, a 'Beiträge zur Ornithologie Nieder Österreichs,' in the Ornithologische Jahrbuch for 1899, concerns observations on local birds that were begun in 1894, when he was sixteen years old. In this paper he expresses thanks to von Tschusi zu Schmidhoffen for supplying certain papers that he needed, and it is probable that Tschusi was an early counsellor in his ornithological studies. His first paper, on '*Muscicapa parva* in Wienerwald,' appeared in the Jahrbuch in 1898.

He studied at the University of Vienna and possibly Berlin, but there is no immediately available record of his academic accomplishments. The honorary title of 'Professor' was given to him at Munich some years later when he joined the staff of the Bavarian State Museum at that place.

Hellmayr's home remained near Vienna at least until 1902 although he was not always in residence. In October, 1900, he met Count Hans von Berlepsch at the jubilee meeting of the Deutsche Ornithologische Gesellschaft in Leipzig—a meeting that bore notable fruit.