

Article XXII.—FIELD NOTES ON *MOLOTHRUS BONARIENSIS*
AND *M. BADIUS*.

BY LEO E. MILLER.

INTRODUCTION.

The American Museum of Natural History's recent expedition to Bolivia and northwestern Argentina acquired information about the breeding habits of various species of birds; and as comparatively little is known of the nesting of birds in South America, it has been deemed advisable to present these observations.

Among the material at hand is a collection of about 1200 eggs, a large number of nests, together with field notes on these species and other birds, taken by the writer, Mr. Howarth S. Boyle who was my constant companion during the last two years of South American field work, and Mr. Pablo Girard, a well-known naturalist of the Province of Tucuman, Argentina.

Unfortunately, the amount of time heretofore available for taking field notes has been comparatively limited; consequently the data available are correspondingly meagre. However, rather than withhold the information it has been possible to obtain until anything like the complete life histories of a number of species has been secured, it has seemed advisable to offer our observations as opportunity permits, even though they are comparatively fragmentary.

An examination of the material collected shows that a large part consists of notes on the breeding habits of several species of the genus *Molothrus* in the Argentine Republic; and while many observations have been recorded from that country, principally by Hudson, the present notes tend to throw additional light on the interesting habits of these birds. It has therefore been decided to present them in a separate paper, the first of a series, it is hoped, on the life histories of South American birds.

Leaving Sucre, the former capital of Bolivia, on December 22, 1915, the expedition proceeded southward over the high Andean plateau ranging in altitude from 9000 to 12000 feet above sea level, toward the Argentine frontier. After riding for twelve days, the three hundred miles had been covered and we reached Laquiaca, a small village on the Argentine side of the border. The journey was almost immediately continued by railway to Rosario de Lerma, in the Province of Salta, and only one hour's time by

train from the city of Salta. This place was reached January 6, and was the first base from which collections and observations were made.

Rosario de Lerma is a pretty town with about one hundred buildings, nestling in a wide, level tract of fertile land. All about are fields of alfalfa, maize and vegetables, pastures, and patches of brush with an occasional clump of rather low, gnarled trees. There is no tall, dense forest in the vicinity. Some of the land is marshy and covered with a thick growth of shrubbery and thorny bushes. Naturally, this type of country is very favorable to the existence of bird life, and our first visits to the rural regions revealed a wealth of material for study.

The rainy season was coming to a close, and apparently bird nesting was nearly over. This correlation of the winter or rainy months with the nesting season of birds is a subject that offers a vast field for study.

***Molothrus bonariensis bonariensis* (Gm.).**

Tanagra bonariensis Gm., Syst. Nat., I, ii, 1788, p. 878. "Bonaria."

Molothrus bonariensis CASSIN, Pr. Ac. Sc. Phil., 1866, p. 19; HUDSON, P. Z. S., 1872, p. 809, and 1874, pp. 153 et seqq. (Buenos Aires); BERLEPSCH, Journ. f. Orn., 1873, p. 249 (Santa Catharina); DURNFORD, Ibis, 1877, pp. 33, 174 (Chupat); GIBSON, Ibis, 1880, p. 14; WHITE, P. Z. S., 1882, p. 601 (Argentine Republic); DÖRING, Exp. al Rio Negro, Zool., p. 41 (Carhue); BARROWS, Bull. Nutt. Orn. Club, VIII, p. 133 (Entrerios); SCL., Cat. B., XI, p. 335; REED, Revista Chilena de Historia Natural, Año XVII, No. 3.

Description.—Male: uniform glossy purplish black, except on the wings and tail which have a pronounced greenish sheen. In specimens with old and worn plumage the glossy purple and the greenish colors disappear, leaving a brownish appearance, particularly marked on the wings and tail. Bill and feet shining black.

Female: Dark ashy brown; paler underneath, sometimes with a yellowish tinge; throat pale grayish, running to almost white at the base of the mandible.

Measurements of Males.

Locality	Wing	Tail	Bill
Rosario de Lerma, Argentine Rep.	113.5	82.5	19
" " " " "	114	82	19
Sarmientos, " "	109	78	19
Buenos Aires, " "	115	83	19
" " " "	112	77	19
Vinto, Bolivia	121	92	20
Mizque, " "	116	85	20
" " " "	118	85	20
Rio Cachimayo, Bolivia	118	86.5	19

Measurements of Females.

Locality	Wing	Tail	Bill
Rosario de Lerma, Argentine Rep.	100	70	17
" " " " "	99	70	18
" " " " "	106	76	18
Bolivia, Buenos Aires	98	67	17
Mizque, " "	105	79	18
Rio Cachimayo, Buenos Aires	104	78	18
Rio Pilcomayo, " "	104	76	18

The males are somewhat larger than the females, and specimens from Bolivia average larger than Argentina birds.

Range.—Distributed through practically the whole of Argentina, including Patagonia. Its range also includes Uruguay, Bolivia, Brazil and Paraguay. It has been reported from the various provinces as follows: Chubut (Durnford); Rio Negro (Hudson); La Rioja (Koslowsky); Catamarca (Fontana); Salta (Borelli); Cordoba (Schulz); Tucuman (Lillo); Pilcomayo (Kerr); Chaco (Venturi); Buenos Aires (Venturi); Entre Rios (Barrows); Mendoza (Reed).

Apparently *Molothrus bonariensis* is not a bird of the high mountains in the Argentine; but in Bolivia (Pulque, between Sucre and the Rio Pilcomayo) it was not uncommon at an elevation of 9400 feet; but wherever I have found the bird it has always been near more or less well-defined river valleys where there were cultivated fields and pastures.

During the height of the breeding season, from October to February in the Argentine, the birds are scattered fairly evenly over any given district, spending the days in an apparently happy, care-free existence in the trees, or feeding in the pastures and fields. At night they resort to the taller trees to sleep.

After the domestic duties of the year are over, the birds congregate in large flocks to spend the winter months. In the Province of Tucuman we found them moving (May, 1916) to the rice-growing and marshy districts in the southwestern part of the province.

May 17 to June 3 found us in camp a mile from the railroad station of Los Sarmientos, near the base of the Andean foot-hills. A number of streams, fed by the rain and snow falling almost daily on the high peaks, rush down the steep mountainside and reaching the level plain, form a chain of lakes, marshes and bogs. Dense masses of *totoras*, or cat-tails, grow in the marshy areas, and the wet, surrounding country is sowed in rice. It is to this region that the Cowbirds revert, arriving in comparatively small flocks, but increasing in numbers until there are tens of thousands.

As the grain is ripening about this time, the birds do an enormous

amount of damage in the rice-fields. All day long, men on horseback ride back and forth through the fields, armed with slings and a bag full of pebbles; they hurl stones and shout themselves hoarse in a vain endeavor to frighten away the marauding hosts.

The birds, in bands of a few individuals to several hundred, arrived each morning at day break, flying low and swiftly, and making a 'swishing' sound as they cut through the air. When immediately over the rice-fields, the band would suddenly swerve as if to circle, but drop almost instantly and eat greedily without a moment's delay. Upon seeing a flock approach the men threw stones and shouted, often succeeding in making it pass straight over or leave the vicinity after circling once or twice. Should the birds alight, the hail of stones soon put them to rout, but not until a few grains of the much coveted rice had been secured by each individual.

As the day advanced the birds spread out over the surrounding country where they were not persecuted, and spent most of the time on the ground near the cattle and horses, often perched on the backs of the grazing animals. At nightfall they returned to the cat-tails, and in passing over the rice-fields again took toll from the planters. The flocks in the marshes assume tremendous proportions, and the babble of voices resembles a rushing wind; the roar of wings, if the masses are suddenly startled by the report of a gun, is not unlike the roll of distant thunder. Before finally settling down for the night they spend some time hopping about on the mud-flats and eating minute animal and vegetable matter.

Carlos S. Reed, F. Z. S., Director of the Natural History Museum, Mendoza, Argentine Republic, gives the results of his investigations as to the food of *Molothrus bonariensis* in a paper in the 'Revista Chilena de Historia Natural, Año XVII, No. 3, 1913. The following is a translation, as literal as possible, of a part of the original paper, which is written in Spanish.

"In the summer of 1910 there occurred in various departments of the Province of Mendoza, a great invasion of *Isocas* (larvæ of a lepidoptera) and in various inspections which I realized in the infected countryside, I was able to confirm that a number of birds occupied themselves in eating the larvæ and adults of these *Isocas* (*Colias lesbia* Fabr.), and among them *Molothrus bonariensis* predominated.

"It is also a voracious destroyer of the white worm (larva of *Ligyrrus bidentulus* Fairm) when these are exposed in plowing furrows in the vineyards. The 'bicho de cesto' (*Æceticus platensis* Berg) is also very much persecuted by the bird with which we are occupied.

"The corn fields suffer damages by reason of *Molothrus bonariensis*, but only during the period between the beginning of the ripening of the ear and

its collection; certainly, one ought not to take this damage into consideration, when during eleven months *Molothrus bonariensis* has fed in the cultivated country, on other products, not on maize, and among these has predominated the larva of *Chloridea armigera* (Hubn.), the most formidable enemy of the maize fields.

"I have examined the stomach contents of more than sixty specimens of *Molothrus bonariensis*, freshly shot, and always, in the various seasons, I have encountered about 90 per cent. of substances of animal origin and the rest of grains, principally of maize, but the maize they have generally obtained from the offal of horses and mules, as in Mendoza a good deal of maize is given to working animals, and as the grain is fed entire, a good per cent. is eliminated without having been digested. It is for this reason that one frequently finds *Molothrus bonariensis* scratching among and turning over the droppings. This custom is the reason for its having been given the common name of 'Vira-Bosta' in Brazil. For this reason *Molothrus bonariensis* may be looked upon as a bird helpful rather than destructive to agriculture."

Molothrus bonariensis bonariensis AT ROSARIO DE LERMA.

The commonest species of Cowbird in the vicinity of Rosario de Lerma is *M. bonariensis*, referred to by the Spanish speaking people as the "Tordo," although the bird usually called the Tordo is a species of Oriole, highly valued as a cage bird on account of its not unmusical singing ability. We saw flocks of them daily (month of January, 1916) in the fields, on the backs of cattle grazing in the pastures, in the courtyards of houses, in corrals, and more particularly in the scattered trees which were almost certain to contain at least one nest of the Ovenbird (*Furnarius*) or of some species of *Synallaxis*. Usually the flocks were composed of from ten to twelve individuals, the bright, glossy males outnumbering the dull, grayish females in the proportion of four to one. Azara gives the proportion of males to females as ten to one, but this disparity is too great for any part of the Argentine known to me.

The birds are noisy, keeping up a loud chatter, especially when a flock is on the wing, or when preparing for the night's sleep. The male bursts into a short, pretty song with frequency, dropping his wings and moving about in a nervous manner while singing. Apparently the female does not sing.

It has been said that the females of this species lay eggs during a period of three or four months; to know how many are laid by a single bird would be interesting, as the number must be very great in order to make allowance

for the incalculable numbers that are wasted, and still provide enough to keep the ranks of the multitudes at their normal level.

We did not find a single egg of *M. b. bonariensis* on the ground, although Hudson states that in the vicinity of Buenos Aires these birds "frequently waste their eggs by dropping them on the ground."¹

Dropping the eggs on the ground might entail a deliberate waste, as we know of no reason why the bird should suppose that they would be hatched and the young reared, if scattered broadcast over the country. On the other hand this might merely indicate that the birds had found no suitable place in which to deposit their eggs. The form of waste caused by the birds laying in old, disused nests, or by laying such a large number of eggs in a single nest that it is impossible for the rightful owner to incubate them and rear the young, can hardly be said to be deliberate, as it is doubtless caused by a lack of intelligence; if the bird designedly scatters its eggs broadcast on the ground, it is wantonly wasteful; if it merely lays in disused nests, or overcrowds nests actually occupied, the bird may simply be stupid.

It would be impossible to say what percent. of eggs laid by this species of Cowbird is wasted. Hudson estimates that each female lays from sixty to one hundred eggs in a single season, and it does not seem to me that this statement is an exaggeration. One female which I dissected had laid three eggs within the few preceding days, and a fourth was almost ready to be deposited.

The bird which suffers most from the parasitic habits of the Cowbird in the vicinity of Rosario de Lerma, is the Ovenbird (*Furnarius rufus*); however, of the great number of eggs laid in the nests of the above named species, our observations tend to show that the greater part are lost. Among the scores of Ovenbird nests which we examined, only two were still occupied by the owners, the desertion being apparently due to the invasion of the Cowbirds. So persecuted were the Ovenbirds that it is difficult to understand how any of them survived in this immediate locality. The nests were common enough, it being not unusual to find several of them in a single tree, but the birds themselves were not abundant. It is possible that some of the pairs may have built several nests each in their vain attempts to escape the attentions of the Cowbirds.

In no instance had the walls or top of the Ovenbirds' nests been broken or perforated in any manner, in order that light could penetrate to the interior; they were not tampered with in any way, and the Cowbirds seemed content to use them just as the Ovenbirds had constructed them.

¹ Argentine Ornithology, Slater and Hudson, Vol. I, p. 74.

I believe that the greater number of *M. bonariensis* that reach maturity are reared by the smaller birds, such as *Poospiza*, *Brachyspiza*, *Geothlypis*, etc., in whose nests only a few eggs are laid, which increases the favorable chances of their incubation. Also, the larger and heavier eggs of the Cow-bird frequently crush at least a part of the smaller eggs which naturally have a more fragile shell, thus forestalling to a marked degree the competition which might arise between the young birds in the nest.

List of Species parasitized by M. bonariensis.

In the course of his several papers on *Molothrus bonariensis*, Hudson mentions the names of the following species as having been parasitized by this species:

<i>Muscivora tyrannus</i>	<i>Troglodytes</i> sp.
<i>Pseudoleistes virescens</i>	<i>Mimus</i> sp.
<i>Sisopygis icterophrys</i>	<i>Anthus correndera</i>
<i>Sporopophila caerulescens</i>	<i>Sturnella</i> sp.
<i>Hapalocercus flaviventris</i> (?)	<i>Poliophtila dumicola</i> (?)
<i>Serpophaga</i> sp.	

White (P. Z. S., 1882, p. 601) gives the following:

Troglodytes musculus

Gibson, Ibis, 1880, p. 15.

<i>Brachyspiza capensis</i>	<i>Spinus barbatus</i>
<i>Troglodytes musculus</i>	<i>Leptasthenura ægithaloides</i>
<i>Furnarius rufus</i>	<i>Progne tapera</i>
<i>Pseudoleistes virescens</i>	<i>Lichenops perspicillata</i>
<i>Planesticus rufiventris</i>	<i>Muscivora tyrannus</i>

Reed, Revista Chilena de Historia Natural, June, 1913.

<i>Sicalis arvensis arvensis</i>	<i>Mimus patagonicus</i>
<i>Pseudochloris aureiventris</i>	<i>Saltator aurantiirostris</i>
<i>Brachyspiza capensis capensis</i>	<i>Diuca diuca</i>
<i>Trupialis militaris militaris</i>	<i>Pitangus sulfuratus bolivianus</i>
<i>Anthus correndera</i>	<i>Elaeena albiceps</i>
<i>Mimus triurus</i>	

Girard, Province of Tucuman, Argentina.

<i>Planesticus rufiventris</i>	<i>Saltator aurantiirostris</i>
<i>Planesticus leucomelas</i>	<i>Thlypopsis sordida</i>
<i>Saltator caerulescens</i>	<i>Thraupis bonariensis</i>

<i>Thraupis sayaca</i>	<i>Paroraria cuculata</i>
<i>Pheucticus aureiventris</i>	<i>Poospiza melanoleuca</i>
<i>Cyanocompsa cyanea argentina</i>	<i>Thamnophilus major</i>
<i>Brachyspiza capensis</i>	<i>Mimus patagonicus</i>
<i>Cyclarkhis viridis</i>	<i>Empidonomus aurantio-atrocristatus</i>
<i>Vireosylva chivi</i>	<i>Molothrus badius</i>
<i>Furnarius rufus badius</i>	<i>Saltatricula multicolor</i>
<i>Geothlypis equinoctialis cucullata</i>	<i>Myiodynastes solitarius</i>
<i>Pitangus sulfuratus bolivianus</i>	<i>Sisopygis icterophrys</i>
<i>Tyrannus melancholicus</i>	

In the vicinity of Rosario de Lerma we found eggs of the species in question in the nests of the following species:

<i>Brachyspiza capensis</i>	<i>Geothlypis aequinoctialis cucullata</i>
<i>Thraupis bonariensis</i>	<i>Fluvicola albiventris</i> , at Embarca-
<i>Furnarius rufus</i>	cion.
<i>Poospiza whitii</i>	<i>Mimus saturninus modulator</i> , at
<i>Poospiza melanoleuca</i>	Tilcara.

Eggs of Molothrus bonariensis.

Of the nearly 200 eggs of this species before me, nearly all of which were collected at Rosario de Lerma, a great variation in marking exists, and there is also some difference in color. As a general rule the eggs are greenish or bluish, rather heavily spotted with reddish-brown; in a very few specimens the background is of a pale flesh-color, and in a small number of others it approaches white, having however a dull grayish tinge; of the entire lot, four only are so lightly marked as to appear unspotted. Not a single egg is pure white or has a pure white background (my standard of comparison is an egg of *Furnarius*) "like the eggs of birds that breed in dark holes"; the majority of these eggs were taken from the darkened interiors of Oven-birds' nests, and not in a single instance was the nest broken in any way to permit the entrance of light.

A type of egg not uncommon is heavily and evenly marked all over with fine dots and larger spots of reddish-brown. Judging from the material at hand I should say that there is a characteristic type of marking running through the eggs of the species if we except the two extremes, viz., those almost unspotted, and those so entirely covered with heavy blotches that they appear to be of a uniform chocolate color.

However, the eggs of each individual seem to vary in some respect from those of any other, as it is impossible to find two exactly alike in comparing

series from different places. Frequently, two or more eggs found in the same nest resemble each other so closely in size, shape and coloration, that I think it is reasonably safe to say they were laid by the same bird.

The shape of the eggs is ovate or rounded ovate. Average size of 20 typical specimens, 24.87×19.74 mm. Largest egg available, 26×21.5 mm.; smallest, 23.75×19.25 .

Nesting Records.

A list of the nests discovered containing eggs of *Molothrus bonariensis* is given below, together with the number of eggs found in each. All but the last three records are of nests found at Rosario de Lerma. On account of lack of time it was impossible to make a thorough investigation of the region or to examine all nests which we observed; but the results of our observations herewith presented will, I believe, throw a good deal of additional light on the breeding instincts of the bird, and particularly upon the number of eggs laid in one nest. In some instances the number was so large that it is hard to believe that there was not some abnormal influence prevailing to stimulate an unusual production.

Jan. 8. *Brachyspiza capensis*. Nest on the ground, among the grasses. Contained one fresh egg of the sparrow, and 2 cowbird eggs; the latter differed greatly, apparently indicating that they had been laid by two individuals.

Jan. 9. *Brachyspiza capensis*. Nest in a bush about six feet above the ground; contained 2 eggs of the owners and 1 cowbird, all fresh. The latter is of a beautiful pale blue color with only a few minute dots which are barely visible.

Jan. 9, *Poospiza* sp.? Nest in a bush, 5 feet up; 2 eggs of the finch, one of which was pecked full of holes, and 1 of the Cowbird. The nest had apparently been deserted as there were no birds around it and all the eggs were addled.

Jan. 10.—*Thraupis bonariensis*. Nest in clump of mistletoe, 6 feet up; contained 2 eggs of the owners with incubation advanced, and three eggs of *M. bonariensis*, one with incubation advanced and two addled. The five eggs filled the nest and it was doubtless impossible for the bird to cover all of them.

A second nest of this species discovered the same day was in the top of a vine-covered sapling, 7 feet up, and contained one young tanager and one young cowbird. Apparently both were newly hatched, but the latter was twice the size of the former and a good deal more active. The nest also contained two cowbird eggs, one fresh and one with incubation advanced.

Furnarius rufus. Nest on the branch of a low tree; contained 2 eggs of the cowbird and two young ovenbirds about ready to leave the nest. One of the eggs was fresh, the other partly incubated.

Jan. 11.—*Furnarius rufus*. A deserted nest was examined which contained 4 addled cowbird eggs besides the shells of a number of others which had become broken.

Jan. 12.—*Poospiza whitii*. In the small nest, made of grasses and placed in a tangle of pumpkin vines, there were 3 eggs of the finch and 1 of the cowbird; incubation was advanced in all except one of the finch eggs, which had been pecked full of holes.

Furnarius rufus. Nest on the branch of a tree 15 feet up. It contained 15 eggs of *M. bonariensis*, two of which fell out when I opened the nest, so only 13 were saved. Of these, one was fresh, the others spoilt. The eggs were in several layers with thin grass partitions between; apparently the ovenbirds had deserted the nest after making several ineffectual attempts to cover them up. A number of cowbirds were singing in the tree and hovering about the nest.

Furnarius rufus. Collected by H. S. B. The mud nest was 12 feet up. It contained 26 cowbird eggs, 11 of which were fresh. As in the foregoing nest, they too had been placed in layers, and the lower ones covered with grass. Some of the eggs seemed to have been laid several weeks before, and 6 were slightly crushed; it was however possible to blow 22 of them.

Jan. 13.—*Furnarius rufus*. Nest 14 to 15 feet up. Contained 1 egg of the ovenbird and 6 of cowbirds, all fresh, but apparently the nest was deserted by the owners, and the *Molothrus* had taken full charge. Of the 6 eggs, 4 had apparently been laid by one bird and 2 by another.

Another nest of the same kind contained 1 ovenbird and 4 cowbird eggs, all of them more or less fresh. Judging by the size, shape and coloring of the cowbird eggs, they had been laid by three different individuals.

Jan. 14. Nine nests of *Furnarius rufus* were examined on this date. Of these seven were empty, but bore evidences of having been used earlier in the season. One of the remaining two contained 9 cowbird eggs, 8 being of *M. bonariensis*, and 1 apparently of *M. rufoaxillaris*; two of the eggs were badly crushed, but the remaining seven were fresh. The 6 eggs of *M. bonariensis* appear to have been laid by three different individuals, two eggs by each.

The other nest contained 25 cowbird eggs, of which 14 were fresh, although it was possible to preserve 23 of the total number. They were piled in the nest without any special arrangement, and none of them was covered with nesting material. A large flock of *M. bonariensis* and a number of *M. rufoaxillaris* were in the tree in which the nest was located, singing

and fluttering about, and showed great uneasiness when the structure was approached. Of the 23 eggs preserved, I think 2 may be referred to *M. rufoaxillaris* and 21 to *M. bonariensis*. While I believe that it is impossible in every instance to identify the eggs of each individual cowbird by its size, color pattern and form, I nevertheless think that in the majority of instances one does not go far astray in using these three criterions in determining how many of the eggs found in the same nest were laid by a single bird. Of the 23 eggs before me, it seems as if there are two 'sets' of 4 eggs each; four of 2 each; and 5 single eggs; also the 2 single eggs of *M. rufoaxillaris*. From this I conclude that no less than 13 different individuals laid in this single nest.

Jan. 15.—*Poospiza whitii*. Nest in a small bush, 18 inches up. Contained 2 eggs of the owners and 1 of *M. bonariensis*. Incubation was well advanced in all of them.

Furnarius rufus. Nest collected by native assistant; he said that it contained about 20 eggs although he broke all but 12 in falling out of the tree. The 12 eggs were all addled, and seem to represent the product of 5 different birds, as follows:—1 set of 4; 1 of 3; 2 of 2 each; and 1 single. Nest deserted.

A second nest of the ovenbird discovered on this date contained 2 eggs of *M. bonariensis*.

Poospiza melanoleuca. The nest of this interesting species was in a clump of bushes about 6 feet above the ground. It contained one egg of the finch and one of cowbird, both fresh.

Jan. 16. *Geothlypis æquinoctialis cucullata*. In a small grass nest of this species, placed at the base of a low bush, I found 3 eggs of the owners and 2 of the cowbird, all fresh. One of the warblers eggs had holes pecked in it.

Furnarius rufus. This nest, which contained the record number of eggs, was brought in by my companion, H. S. Boyle. It contained one egg of the ovenbird and 37 cowbird eggs. Of this number 5 were fresh, and the others in such bad condition that it was possible to save only 20 of the entire number. The eggs were in several layers, the lowest of which was covered with nesting material. No ovenbirds were seen in the vicinity of the nest, but a large flock of *M. bonariensis* was in the tree and about the nest when it was discovered.

Another nest, brought in by our native assistant, contained 1 ovenbird and 17 cowbird eggs, all fresh, so it was possible to preserve the 'set' intact. Three of the cowbird eggs had shells perforated with small holes. It seems probable that the 17 cowbird eggs were laid by 12 different birds, there being, apparently, two sets of 3 eggs; one of 2; and 9 single eggs. The boy, who

during the eighteen months he was in our employ proved himself to be a careful observer, stated that the tree from which he took the nest was "full of *tordos negros*," and that one of them was fighting with the ovenbird at the entrance of the nest.

Jan. 28. *Fluvicola albiventris*. Embarcacion, Chaco. Nest basket-shaped, made of fine grasses and lined with feathers. Placed in a bush about two feet above the water of a lagoon. Contained one egg of the fly-catcher and one of *M. bonariensis*, both addled.

Feb. 12.—*Mimus saturninus modulator*. Tilcara. Apparently a deserted nest, in the center of a large thorn bush, 3 feet above the ground. Contained 14 eggs of *M. bonariensis*, all addled; of this number it was possible to preserve 10, which seem to represent the product of 7 birds — three sets of 2 each, and four singles.

Feb. 10.—*Mimus saturninus modulator*. Tilcara. Nest made of grasses and placed in the old nest of a *Synallaxis*, in a cactus about 5 feet up. Three eggs of the owner and 1 of cowbird which somewhat matches the mockingbird's eggs in shape and coloration. Incubation advanced in all.

***Molothrus badius* (Vieill.).**

Molothrus badius BURM., La Plata Reise, II, p. 495; SCL. and SALV., Nomencl. p. 37; HUDSON, P. Z. S., 1874, p. 163; DURNFORD, *Ibis*, 1877, p. 174; SCL., Cat. Am. Bds., p. 135.

Description.—Male: Dull brownish-gray, paler underneath; wings chestnut. Tips of primaries, inner portion of secondaries, and tail blackish. Bill and feet blackish. The coloration of the female is similar.

Range.—Bolivia, Argentina and Paraguay.

Commonly called Bay-winged Cowbird. These birds are usually very abundant, and live in flocks of from half a dozen to twenty or more individuals, but congregate in immense numbers at night. They are found at much greater altitudes than *M. bonariensis*; at Cuchicancha, Bolivia (east of Cochabamba), alt. 11,000 feet, *M. badius* was one of the commonest birds, spending the days in the grain fields, and also in the freshly plowed areas. They were tame and unsuspicious, but if alarmed, uttered harsh cries as the flock took wing, and flew in a compact mass to a fence or bush a short distance away.

The whole region about Cuchicancha is naturally treeless; but a double row of willows, several hundred feet long, planted many years ago, furnishes protection for the birds during the cold nights. Large numbers of birds of many species seek this refuge at sunset, and among them the Bay-wing is one of the most abundant, arriving in small flocks until there are many hundreds of them in the tree-tops. Compared with the White-throats

(*Brachypiza capensis*) with which they share the same trees, they are not very active, but spend a good deal of time sitting on the same branch, chatting and gesticulating with their neighbors.

Near Cochabamba, we found *M. badius* to be a very common bird; and while we were not fortunate enough to be in that vicinity during the nesting season, we were frequently told of the battles which take place between the Bay-wing and the Ovenbird (*Furnarius*) for the possession of the latter's nest. In these fights the Cowbird is said to be successful in the majority of instances, and often succeeds in killing his adversaries. The museum of natural history and the museum connected with the veterinary college in Cochabamba, have on exhibition small groups of the mounted birds, illustrating this pugnacious trait of character; and the Bay-wing is always shown as victor, standing over the bloody body of the Ovenbird. This may, of course, be an exaggeration, but I nevertheless think there must be a good foundation for the belief.

At Rosario de Lerma, Argentina, *Molothrus badius* was not nearly so common a bird as *Molothrus bonariensis*, and we found no nests until toward the end of the breeding season, that is, not until the end of February.

This species of Cowbird differs from the other members of the genus found in the Argentine in that, with possibly a few exceptions, it incubates its own eggs. However, the bird is so gregarious in its habits that it is not common for the flocks to remain together during the breeding season and for several females to lay in the same nest. The nests of other birds are frequently used, the rightful owners having in many instances been ejected by force.

Hudson speaks of the attacks of the Bay-wings on both the adult and young of the Leñatero (*Anumbius acuticaudatus*) with fatal results to the latter.

Eggs of Molothrus badius.

The eggs of *M. badius* are easily distinguished from those of *M. bonariensis*, by their smaller size and intense coloration. They are elliptical in shape and heavily marked with reddish-brown; frequently there is a scattering of short, thick lines of deep chocolate color or black on one of the ends or all over the eggs. Size of eggs, 23:50 × 19:50.

Nesting records of Molothrus badius.

Tilcara, Feb. 8, 1916. This nest, apparently built by *M. badius*, was placed in a hole in an adobe wall, 10 feet up. It was constructed of soft grasses only and merely formed a pad for the eggs. When discovered the nest contained 5 fresh eggs, and although it was under observation several

days, no more were deposited. A flock of four or five Bay-wings was constantly in the neighborhood, and I on a number of occasions flushed one of them from the nest. As I approached the wall they always grew very much excited and fluttered about, with loud, resentful cries. Four of the eggs are very much alike, while the other is smaller and marked in a different pattern.

There were many similar holes in the wall (ruins of an old Indian dwelling) although no others were occupied. A few of the holes contained old nests, and in one of them I found three dead, nearly full-fledged young birds, apparently of *M. badius*. Numerous holes had also been excavated entirely through the wall which was about eighteen inches thick.

Tilcara, Feb. 10, 1916. Nest of *Mimus saturninus modulator*. The Mockingbird nest had been placed among the remains of a nest of a *Phacellodomus*, in the crotch of a cactus, several feet up. It contained five fresh eggs, two of them typical of *M. badius* and three that closely resemble the eggs of the Mockingbird, to which species they probably belong. Collected by our native assistant.

Rosario de Lerma — Feb. 20, 1916. Nest of *Furnarius rufus*, containing 10 fresh cowbird and 1 addled ovenbird eggs. The former are easily separable into groups, and seem to indicate that four females participated in laying in this one nest. Of *M. badius* there are 2 sets of 2 eggs each, and one set of 3 eggs. Then there are three eggs between which there is a great similarity but all differ greatly from any of the others; both in shape and color they somewhat approach the eggs of *M. rufoaxillaris*, but I am unable to definitely determine their identity.

A second nest of *F. rufus* contained one typical egg of the Bay-wing, addled.

Nest of *Phacellodomus rufifrons*. Collected by H. S. Boyle. The large, pear-shaped nest contained 17 eggs of *M. badius*, two of which were just hatching. Of the remaining 15 eggs it was possible to preserve 13 that ranged from fresh to partly incubated and addled. There is such a diversity in size and color in this lot that I am unable to say how many females probably used this nest, but evidences tend to show that there were not less than five. The eggs might be placed in loosely defined groups as follows: — One set of 4; one of 3; three of 2.