

AMERICAN MUSEUM NOVITATES

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CITY OF NEW YORK FEBRUARY 2, 1949 NUMBER 1406

NOTES ON SOME PLOCEIDAE FROM WESTERN ASIA¹

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INTRODUCTION

In 1937 the American Museum of Natural History began to receive from Dr. Walter Koelz very large series of birds collected during his travels in various parts of India, Afghanistan, and Persia. So far, some 25,000 skins have been received, the earliest ones dating from the end of 1936 and the most recent ones from the end of November, 1947. The size of this collection is remarkable and speaks highly for the industry of Dr. Koelz, particularly when one considers that during this time he was engaged in other pursuits, notably the collecting of botanical specimens.

Dr. Koelz has very generously offered to the workers of the American Museum the privilege of studying this magnificent lot of fresh material. The results will be published in a series of reports, of which this is the first. The customary itinerary is omitted as some of its details remain to be checked.

I appreciate the opportunity given by Dr. Koelz to work on his great collection. I have received much friendly help in every way from Dr. Ernst Mayr and I am deeply grateful for his advice and interest in this study. I am also grateful to Mr. Jean Delacour and Dr. James P. Chapin for valuable suggestions.

THE GENUS *PETRONIA*

Despite the fact that various authors have in the past, at one time or another, merged *Gymnoris* and *Carpospiza* under *Pe-*

¹ Notes from the Walter Koelz Collections, Number 1.

tronia, Hartert, although admitting that *Gymnoris* was not actually very distinct from *Petronia* and could very easily be merged with it, has continued, as well as some later authors, to observe the separation of the Rock Sparrows into the three genera, two of which, *Petronia* and *Carpospiza*, are monotypic.

Carpospiza is intermediate in every way between *Petronia* and *Gymnoris*. That is perhaps best shown by the shape of the bill, but there are other points of similarity such as the presence in *Carpospiza* of white tips on the tail feathers as in *Petronia*. The difference between the shape of the bill of *Carpospiza* and that of *Gymnoris* is not very great, and the general body coloration can be identical in females of *Carpospiza* and *Gymnoris*. We have adult females of the western race of *Gymnoris* (*occidentalis*) that match perfectly the pale sandy color of female *Carpospiza*. These specimens lack the yellow throat patch, and the trace of rust on the lesser wing coverts is so faint that actually the best difference is not so much the shape of the bill as the lack in *Gymnoris* of the white tips on the tail feathers.

All these sparrows, furthermore, have similar habits, and the differences between *Petronia*, *Gymnoris*, and *Carpospiza* can be considered no more than specific. I therefore synonymize *Gymnoris* and *Carpospiza* with *Petronia*.

PETRONIA PETRONIA

Two races of this sparrow are found in Persia. One occupies the northern mountains from Azerbaijan into the Elburz, and the other the more southern mountains in the rest of Persia from Kermanshah and Luristan on the west, through central and southern Persia, to Khorasan on the east, this same race continuing into and through Afghanistan to Kashmir.

The more northern race is *Petronia p. exigua* Hellmayr, 1902. This race, originally described from the region of the Caucasus to Rostov on the Don in the west, was said to differ from the nominate race, *P. p. petronia* Linnaeus, 1766 (type locality, northern Italy, as fixed by Hartert, 1910), by being less earth brown above, more dusty gray, and by having the stripes on top of the head paler and less distinct, and also by having a little more powerful bill.

The more southern and eastern race, *P. p. intermedia* Hartert, 1901 (type locality, Gilgit, Kashmir), was said by its author to range from Kashmir to Kandahar, Afghanistan, and to be

lighter, larger, and with stripes more indistinct than in *P. p. petronia*.

No specimens from the Caucasus are available for examination; our only three specimens from the range of *exigua* are three adult males collected at Livan, Azerbaijan, on November 17 and 18. When these are compared to two typical specimens of *P. p. petronia* collected in northern Italy on November 20 and 30, the birds of Azerbaijan are not earth brown but dull grayish brown and have much less distinct stripes on top of the head.

When these November specimens are compared to specimens collected in Afghanistan (*P. p. intermedia*) from September 30 to October 12, and to a series from Luristan in western Persia collected from October 25 to November 11, the birds of Afghanistan are seen to be definitely more tawny, less gray than those of Azerbaijan. Those from western Persia, though perhaps very slightly grayer, are, on the whole, indistinguishable from those of Afghanistan. Two late September (26 and 27) specimens from Khorasan in eastern Persia are exactly similar to the specimens from Afghanistan.

All these fall specimens have just completed the moult and are in very fresh plumage. By the middle of January the birds in our series already show a considerable amount of wear resulting in a significant change in coloration. The plumage is no longer so tawny, but duller and grayer. Examination shows that the type of *intermedia*, as well as two paratypes (January 9-13), is similar to other January specimens from Luristan, though the slight difference existing in the fresh plumage still holds, these latter being very slightly grayer. Unfortunately I have no specimens of *exigua* available from this period, but a similar wearing down and darkening of the plumage must probably occur in this race.

From this period, December 30 to February 12, I have a large series from Iran and Kirman in central and southeastern central Persia. All these birds are grayish and dull. It is possible that some are migrant *exigua* from farther north, but lacking comparative specimens of *exigua* I can only say that as a series they are indistinguishable from the January specimens from Luristan, though a few average a little grayer.

Later on in the season, from the middle of March through April and May, and later, the plumage continues to wear, and, losing its grayish cast, becomes a bleached, burned-out brown.

The only comparative specimens that I have from this season are some from Luristan, two from Fars in southern central Persia, and one from Afghanistan. The birds from these three regions are on the whole similar, but the birds of Fars average a little grayer.

Throughout all these seasons, early fall to May, typical *P. p. petronia* from northern Italy is darker and more earth brown in all plumages.

The discrimination between all the various populations of *P. petronia* found in Persia, Afghanistan, and Kashmir must then take into consideration two factors, that of the progressive wear of the plumage and that of geographical distribution. In fresh fall plumage the difference between *P. p. exigua* and *P. p. intermedia* is well marked. The birds of northern Persia (*exigua*) are dull gray brown; those from Kashmir, Afghanistan, Khorasan, and Luristan are tawny brown.

I lack worn specimens of *exigua* and fresh specimens from central, southeastern central, and south central Persia, but in view of the fact that birds in worn plumage from these regions are as a series very close to, or indistinguishable from, those of

MEASUREMENTS OF ADULT MALES

Races and Locality	No.	Wing	Tail	Bill
<i>P. p. petronia</i> Northern Italy	8	93.0-100.0 (95.75)	48.0-54.0 (50.70)	14.0-16.0 (14.94)
<i>P. p. exigua</i> Azerbaijan	3	100.5-104.0 (102.83)	53.0-55.0 (54.33)	15.0-16.0 (15.50)
<i>P. p. intermedia</i> Western Persia ^a	12	99.0-105.0 (101.60)	50.0-57.0 (54.50)	15.0-18.0 (16.30)
Iran	12	97.0-106.5 (102.40)	51.0-59.0 (55.0)	14.5-16.5 (15.67)
Fars	2	102.0, 102.0	54.0, 57.0	15.0, 16.0
Kirman	10	101.0-108.0 (103.25)	52.0-57.0 (54.23)	14.5-16.0 (15.35)
Khorasan	1	104.0	52.0	15.5
Afghanistan	9	100.0-105.0 (102.77)	52.0-57.0 (54.25)	14.0-16.0 (15.30)
Kashmir, Gilgit ^b	3	103.0-104.0 (103.66)	55.0-57.0 (56.33)	15.0-15.5 (15.16)
Gilgit, type, ad. ♂		104.0	57.0	15.5

^a Includes one each from Kermanshah and Bakhtiari and 10 from Luristan (Durud).

^b Includes type of *P. p. intermedia*; one of the two other specimens is an unsexed adult.

Luristan in western Persia, I refer the birds of Iran (central), those of Kirman (southeastern central), and those of Fars (south central) to *intermedia*. But as some of the specimens from these central regions do average a little darker than in the regions on either side, Luristan on the west and Afghanistan and Kashmir on the east, it is possible that study of additional material might show that the range of *exigua* extends farther south than the Elburz Mountains into central Persia.

***Petronia petronia exigua* Hellmayr**

AZERBAIJAN: Livan, November 17-18, 1940, 3 ad. ♂.

***Petronia petronia intermedia* Hartert**

PERSIA: Kermanshah: Gasrishirin, January 2, 1941, 1 ad. ♂. Bakhtiari: Imarat, February 17, 1 ad. ♂. Luristan: Khali Kuh, June 1, 1940, 3 ad. ♂, 2 ad. ♀; Garun, January 29, 1941, 1 ad. ♂; Durud, January 23-April 2, 3 ad. ♂, 3 ad. ♀, May 21, 1 ad. ♀, August 27-28, 1 ad. ♂, 2 ad. ♀, 1 imm. ♀, October 25-November 11, 2 ad. ♂, 2 ad. ♀. Iran: Dehibakri, January 28-29, 1940, 8 ad. ♂, 5 ad. ♀; Maskun, February 12, 4 ad. ♂, 2 ad. ♀. Fars: Persepolis, March 11, 1 ad. ♂; Dastaijin, April 8, 1 ad. ♂. Kirman: Balvard, December 30-31, 1939, 7 ad. ♂, 2 ad. ♀; Dehishib, January 17, 1940, 3 ad. ♂, 1 ad. ♀, 1 unsexed ad. Khorasan: Shahrud, September 26-27, 1 ad. ♂, 1 ad. ♀.

AFGHANISTAN: Nozi, June 22, 1937, 1 imm. ♀; Gandacheshma, July 10, 1 imm. ♂; Sufian, July 18, 1 imm. ♂, 1 imm. ♀; Zebak, July 21, 1 ad. ♀; Kargasi Pass, August 9, 1 ad. ♀; Chasmaegawan, September 9, 1939, 1 ad. ♂; Dehmiana, September 17, 1 ad. ♂; Safedsang, September 19, 1 ad. ♀; Zehnadir, September 26, 1 ad. ♀; Kotalibedak, September 26, 1 ad. ♂; Khami Deh, September 30, 5 ad. ♂, 3 ad. ♀; Burchao Pass, October 12, 1 ad. ♂.

PETRONIA XANTHOCOLLIS

The range of this species is from India westward through Sind, Afghanistan, Baluchistan, and Persia to Mesopotamia. In Mesopotamia, according to Ticehurst (1921, Jour. Bombay Nat. Hist. Soc., vol. 28, p. 230), the birds arrive in April in the date-palm areas which extend from Fao in the extreme south to Baghdad, breed in May or earlier, and leave again in August and September.

Three races have been described: the more eastern birds of India, with the exception of Sind, as *Petronia x. xanthocollis* Burton (type locality, Bengal); those of Sind, Baluchistan, and southern Afghanistan as *P. x. transfuga* Hartert (type locality, Bagu Kelat, eastern Baluchistan); and those of Persia, from

Fars westward, as *P. x. occidentalis* Koelz (type locality, Abulhassan, near Sar i Dasht, Bakhtiari).

Examination of the specimens in the Koelz collections together with other series from the American Museum of Natural History shows that these three races differ from one another principally in the general depth of their coloration. All these series were collected from February through June 15 in peninsular and central India, northern Punjab, eastern Afghanistan, Sind, eastern Baluchistan, Seistan in eastern Persia, and in western Persia from Borazjan in the western part of Fars through Bakhtiari to Dizful in Khuzistan.

Petronia x. xanthocollis is the darkest, the whole upper plumage being a light earth brown and the lesser wing coverts chestnut. Our measurements also show that it has a slightly shorter wing and tail than the other two races.

Petronia x. transfuga is exactly intermediate in coloration between *xanthocollis* and *occidentalis*. It is sandy brown, and the lesser wing coverts are considerably paler, reddish orange rather than chestnut as in *xanthocollis*. *P. x. occidentalis* is the palest of all. Above it is sandy without a touch of brown, and the lesser wing coverts are the color of pale rust. The yellow of the throat is also perhaps slightly paler than in *xanthocollis* or *transfuga*, no difference being apparent as regards this character between these last two.

In *occidentalis* the bill is also a little more slender, less thick at the base than in the other two forms. In 28 adult males from India the width of the bill at the nostril is 5.5–6.5 (6.05), in 12 from eastern Baluchistan 5.5–6.5 (5.95), and in eight from western Persia 5.2–5.8 (5.50). In terms of percentage the thickness of the bill to its length is: India 38.0–47.5 (43.20) per cent, Baluchistan 39.3–46.4 (42.86) per cent, western Persia 35.3–41.6 (38.84) per cent.

The series of *transfuga* and *occidentalis* used for comparison include the types of both and are the original series from which these two races were described. In all series there is a certain amount of individual variation in the depth or paleness of the color, but there is never any doubt as to the correct identification if comparison is based on a combination of characters—color of the upperparts, color of the lesser wing coverts, shape of bill, and measurements.

The birds of northern Punjab (Kangra) are identical to those

of central and peninsular India (*xanthocollis*). Those of eastern Afghanistan (Laghman) are perhaps very slightly paler than the birds of Kangra, but the difference is extremely slight. No doubt as the populations work southward through eastern Afghanistan into eastern Baluchistan they get progressively paler.

Two specimens from Sind are indistinguishable from others of typical *transfuga* from Baluchistan. The four specimens from Seistan were collected from June 12 to 15 and are very badly worn. They appear to be a little paler than typical *transfuga* collected in March and April in eastern Baluchistan, but how much this is due to wear is impossible to tell. The bill also averages very slightly slimmer, but the size of the sample is insufficient. As in the case of the birds of Laghman, the birds of Seistan probably follow the westward trend towards a reduction in color.

COMPARATIVE COLOR NOTES OF ADULT MALES

<i>Petronia x. xanthocollis</i>	<i>Petronia x. transfuga</i>	<i>Petronia x. occidentalis</i>
	Paler than <i>P. x. xanthocollis</i>	Paler than <i>P. x. transfuga</i>
Upper parts light earth brown	Upper parts sandy brown	Upper parts sandy
Wing coverts chestnut	Wing coverts reddish orange	Wing coverts rust color

MEASUREMENTS OF ADULT MALES

Race and Locality	No.	Wing	Tail	Length of Bill	Width of Bill
<i>P. x. xanthocollis</i>					
No. India	7	81.0-85.5 (82.65)	45.0-51.0 (48.00)	13.0-14.5 (13.85)	5.5-6.4 (6.00)
C. India	6	80.0-85.5 (82.70)	47.5-52.0 (49.00)	13.0-15.0 (13.75)	5.9-6.5 (6.17)
So. India	15	81.0-88.0 (84.00)	43.0-51.0 (48.25)	13.0-15.0 (14.10)	5.7-6.5 (6.02)
<i>P. x. transfuga</i>					
Baluchistan	12	82.0-87.5 (85.00)	47.5-54.0 (52.00)	13.0-15.0 (13.88)	5.5-6.5 (5.95)
Seistan	4	80.0-85.0 (82.38)	48.0-54.0 (50.50)	14.0-14.5 (14.12)	5.5-6.0 (5.70)
Type ad. ♂		87.0	53.0	14.0	6.5
<i>P. x. occidentalis</i>					
W. Persia	8	83.0-90.0 (85.10)	47.5-54.0 (50.50)	13.0-15.0 (14.25)	5.2-5.8 (5.50)
Type ad. ♂		86.0	54.0	14.0	5.5

***Petronia xanthocollis xanthocollis* Burton**

AFGHANISTAN: Laghman, May 25-26, 1937, 4 ad. ♂.

INDIA: Northern Punjab: Kangra, Bhadwar, March 29-April 10, 1933, 4 ad. ♂. Nepal: Simra, March 5, 1947, 1 ad. ♀; Amlekhganj, March 6, 1 ad. ♀. United Provinces: Lucknow, December 10, 1936, 1 ad. ♂; Siswa Bazar, January 30, 1947, 1 ad. ♀; Nichlaul, February 2, 1 ad. ♂; Kalnahi, February 22, 1 ad. ♂. Bihar: Muhammadganj, August 19-September 3, 1947, 1 ad. ♂, 1 ad. ♀, 4 imm. ♀; Nawadeh, November 11, 3 ad. ♂, 1 ad. ♀. Central Provinces: Bina, February 20, 1946, 2 ad. ♀; Bheraghat, March 22, 1 ad. ♂, May 17, 1 unsexed imm., December 11-13, 1 ad. ♂, 1 ad. ♀, 1 unsexed ad.; Mandla, June 25, 1 unsexed imm. Southern Bombay Presidency: Londa, January 8-March 12, 1938, 6 ad. ♂, 5 ad. ♀; Jagalbed, February 18-March 9, 4 ad. ♂, 1 ad. ♀. Madras Presidency: Nilambur, March 4, 1937, 1 ad. ♂, 1 ad. ♀; Kodur, March 18, 1 unsexed ad.; Cuddapah, March 20, 1 ad. ♂.

***Petronia xanthocollis transfuga* Hartert**

SIND: Khinjar Lake, February 2, 1934, 1 ad. ♂; Hyderabad, April 29, 1937, 1 ad. ♀.

***Petronia xanthocollis occidentalis* Koelz**

PERSIA: Fars: Borazjan, April 11, 1940, 1 ad. ♂. Khuzistan: Dizful, April 23, 1 ad. ♂. Bakhtiari: Abulhassan, April 28, 1 ad. ♂ (the type of *P. x. occidentalis*); Talimausur, April 28, 2 ad. ♀; Cheshmashirin, April 29, 3 ad. ♂; Belu, May 1, 1 ad. ♀; Pashmshurun, May 8-9, 2 ad. ♂, 1 ad. ♀.

***Petronia brachydactyla* Bonaparte**

SYNONYM: *Petronia brachydactyla psammochroa* Reichenow.

WESTERN PERSIA: Bakhtiari: Marbirinji, April 25, 1940, 3 ad. ♂, 1 ad. ♀; Mulikiaulia, April 26, 1 ad. ♂, 1 ad. ♀; Sar i Dasht, April 27, 1 ad. ♂; Abulhassan, April 28, 1 ad. ♂; Siachal, April 29-May 10, 3 ad. ♂; Cheshmashirin, May 13, 1 nestling ♂; Labisufed, May 14, 1 nestling ♂. Luristan: Safed Kuh, May 11-13, 1941, 2 ad. ♂; Chamchid, May 26, 1 ad. ♂; Kalisar, June 4, 1 ad. ♂; Durud, May 7-23, 8 ad. ♂, July 5, 1 ad. ♂, August 17-26, 3 ad. ♂, 1 ad. ♀.

EASTERN PERSIA: Khorasan: Turbati Haidari, September 13, 1940, 1 ad. ♀.

The type locality of *Petronia brachydactyla* is "Arabia, Abyssinia," but although it occurs in these countries it does so only as a winter visitor, its breeding range being Syria and Persia.

Bates (1936, Ibis, p. 545), in his study of the birds of western and central Arabia, reports having seen *brachydactyla* near Mecca on April 9 moving together in an "immense flock." Some of the males dissected had the testes rather large, and the birds behaved as if "they must have been about to leave for their breeding place in Syria or Persia." Ticehurst (1921, Jour. Bombay Nat.

Hist. Soc., vol. 28, p. 230) reports on specimens which "agree well with Arabian specimens" and were collected on April 18-19 from migrating flocks "passing up the line of the Jebel Hamrin range going N.N.W." This range is just across the border from Luristan and Kermanshah.

I had no winter specimens, for all the specimens in the Koelz collection, as well as those of the American Museum of Natural History, were collected during the breeding season in Syria and Persia, including Persian Baluchistan. Examination of all these breeding specimens shows that they are indistinguishable from one another. All the adults are in worn plumage and all are identical in coloration. The measurements also are alike. Twenty-five adult males from western Persia (Luristan and Bakhtiari, 21 from April 25 to June 4, and four from July 5 to August 27) measure as follows: wing, 90.0-102.0 (96.38); tail, 42.0-52.0 (46.85); bill, 12.5-13.5 (12.90). Fifteen adult males from Syria and Lebanon (May 25 to June 18) measure: wing, 93.0-98.5 (96.0); tail, 46.0-52.0 (48.27); bill, 12.5-13.5 (13.0).

One adult male and one adult female (May 1 and 2) from Sarhad in Persian Baluchistan measure: male, wing 93.0, tail 47.0, bill 13.0; female, wing 92.0, tail 48.0, bill 13.0. No females were available from Syria, and in three from western Persia the wing is 89, 90, 94.

Sarhad is the type locality of *P. b. psammochroa* Reichenow, 1916, described as being paler and larger than *brachydactyla* from Arabia and Abyssinia. When *brachydactyla* arrives in Arabia and Abyssinia it does so in fresh winter plumage, and even though I have not examined winter specimens, I presume that in this plumage the birds would be darker than in the worn and faded plumage of the breeding season. Reichenow's *psammochroa* (paler) would appear to have been based on this difference in plumage, for when the birds have arrived to breed in Sarhad from their winter grounds in Arabia and Abyssinia, comparison shows that these topotypes of *psammochroa* do not differ in any respect from other breeding specimens from Syria and Persia.

PASSER DOMESTICUS

As the status of the House Sparrow in Persia and neighboring countries is somewhat confused, the large series in the Koelz collection offers a good opportunity for review. This series consists of 331 specimens: 196 from all parts of Persia except Seis-

tan and Persian Baluchistan; 31 from Afghanistan; and 104 from India, the Indian series being made up of 43 from Kashmir; 11, Nepal; 6, northern Punjab; 11, United Provinces; 2, southern Bengal; 25, Bihar and Central Provinces; and 6 from southern India. Together with these, additional material from the collection of the American Museum of Natural History was examined. This additional material is made up of series from Palestine and Syria through to Iraq and Kurdistan, Zarudny's original specimens from Seistan and Persian Baluchistan, another series from Kashmir, as well as isolated specimens from southern India, Assam, northern Burma, Ceylon, Transcaucasia, Transcaspia, and Turkestan including a small series from Djarkent. In addition, Mr. Hermann Grote has kindly furnished the descriptions of two forms and Zarudny's measurements of the original series of one of these forms from the southern shore of the Caspian Sea.

It is apparent that two types of birds are present in this material, one in which the cheeks are gray or dark, and the other in which they are pure white or slightly tinged with gray. But owing to seasonal change and wear the relationships are not always easy to determine, for as the plumage wears, the cheeks get progressively paler or whiter in all the various forms and, unfortunately, despite the great quantity of material, comparative specimens were not always available.

There are, however, two other differences that can be used for discrimination. These differences, which are not always associated with the color of the cheeks, are (1) in size and (2) in the depth and richness of the color of the chestnut areas. In size, the western birds are larger and the eastern ones smaller, the birds of India from the United Provinces south being particularly smaller. In the depth of the chestnut, the more northern birds from the southern Caspian through to Nepal are darker than the birds of the Persian Plateau and those of India from the United Provinces south.

In this study all color comparisons have been made with adult male specimens in comparative state of plumage; with the exception of *P. d. semiretschieensis*, only birds in breeding, that is worn, plumage have been used.

The gray-cheeked birds follow a gentle and very gradual west to east cline in both color and size. The largest, grayest, and those with the darkest cheeks are found from Palestine and

Syria through Iraq up to and including most of western Persia. The birds of Palestine and Syria were called *P. d. biblicus* by Hartert in 1910 (type locality, Sueme, Palestine), and they differ from the nominate race by being considerably paler and by the color of the chestnut areas, which is not so deep.

After examining very large series from the Mesopotamian Plain, Ticehurst (1923, Jour. Bombay Nat. Hist. Soc., vol. 28, p. 231) states that these birds "match typical *biblicus* in every way," and that "in southwest Persia I have seen *biblicus* from Shustar, Dizful, and even up to Kermanshah. The south coast of the Caspian is inhabited by sparrows which I cannot separate from the typical form." Except as regards the birds of the south coast of the Caspian, our material largely confirms Ticehurst.

Examination of a series from Palestine and Syria, which includes the type and paratypes of *biblicus*, shows that these birds match exactly other specimens from Iraq, as well as all our specimens from Azerbaijan, Kazvin, Hamadan, and Kermanshah. However, our specimens from Durud in eastern Luristan, and those from Bakhtiari, and Dizful and Ahwaz in Khuzistan not only get smaller but also paler, both as regards cheek patches and general color, and this tendency increases as one goes farther east, until the palest and smallest birds are met with in Khorasan, Kirman, Seistan, and Persian Baluchistan. These paler birds from Luristan and Khuzistan eastward have been named *persicus* (1916) by Zarudny and Kudashev (type locality, Karun River, Khuzistan). It is somewhat unfortunate that a type locality farther east was not chosen, for Khuzistan seems to be a region where the two forms meet and intergrade, so the statements of both Ticehurst and Zarudny could be correct. However, on the whole, our specimens from Khuzistan support Zarudny, for they are paler and smaller than *biblicus* from farther west.

North of Bakhtiari the line where *biblicus* and *persicus* meet seems to pass through east of Hamadan and Kazvin, birds from these two localities being very close to *biblicus*, if not indistinguishable from it, whereas in the region of Tehran and at Isfahan the birds are the paler and smaller *persicus*.

The birds along the southern Caspian from Talych in Transcaucasia to Gurgan (formerly Astrabad) were called *hyrcanus* (1916) by Zarudny and Kudashev (type locality, Astrabad). Mr. H. Grote supplied the description of this form which differs

from the typical (*P. d. domesticus*) and Semirychensk sparrows by being less gray and lighter on the cheeks and sides, by having the gray on the cheeks more restricted, and by being darker on the upper parts of the body. The same differences separate it from *biblicus* which is indistinguishable from the birds of the Semirychensk Mountains. From *persicus*, *hyrcanus* differs by being darker above, by having whiter cheeks, and by having the chestnut areas of a considerably darker and richer color. The measurements of Zarudny's original series supplied by Grote, as well as those given by Stresemann (1928, Jour. Ornith., vol. 76, p. 354), show also that *hyrcanus* is smaller than *biblicus* and perhaps slightly smaller than *persicus*.

My only specimens of *hyrcanus* are a small series from the type locality (Gurgan or Astrabad). Their characters are well marked and separate them well from *biblicus* and *persicus* by the differences given above. In the list of Zarudny's localities of *hyrcanus* sent by Grote, the westernmost specimen along the southern Caspian came from Resht and that of Stresemann (*loc. cit.*) came from near-by Pahlevi. Although Zarudny gives the range of *hyrcanus* as extending as far west as Talych in Transcaucasia, one adult male in my series from Talych matches exactly the larger size and color of my eastern Azerbaijan birds from Ardebil which I cannot separate from typical *biblicus* from Palestine. It appears therefore that the western end of the range of *hyrcanus* along the southern Caspian should be shortened. Until additional specimens are examined, particularly from coastal localities, it may be fixed as somewhere between Pahlevi and Ardebil.

Zarudny says that at Irak Ajmi (the region in northwestern central Persia between Hamadan and Isfahan), *hyrcanus* merges with *persicus*. In my large series I have not found in this region a single small dark bird with pale cheek patches. All my specimens are *biblicus* on the west and *persicus* on the east. So far, the *hyrcanus* specimens, the list of which was sent by Grote, the specimens of Stresemann, and mine from Gurgan all come from the other side of the great barrier of the Elburz.

In Afghanistan, with the exception of the western lowlands in which I still find *persicus*, my specimens from the rest of the country are similar in size but have paler or whitish cheeks and are also a little lighter in general coloration than my topotypical *hyrcanus*.

In northern Afghanistan, Meinertzhagen (1938, Ibis, p. 507) found *P. domesticus* breeding, as well as passing through "in a northerly direction, which must have taken them right over the Hindu Kush and down to the Oxus Valley." Some of these migrants may have continued into Turkestan. Meinertzhagen, who worked out his collection in Leningrad and therefore had the opportunity to compare his material with Russian series, calls his Afghanistan birds *P. d. bactrianus*.

This name was given by Zarudny and Kudashev (1916) to the birds of Turkestan (type locality, Tashkent). This form, which is said by its authors to migrate largely south in winter, is described as having clearer and whiter cheeks than any of the forms considered so far (*biblicus*, *persicus*, and *hyrcanus*) and to be a little paler in general coloration than *hyrcanus*.

I have only a few isolated specimens from the range of *bactrianus* as indicated by Zarudny. These specimens, from Molla Kari, Buchara, and Merw in Transcaspiia and Turkestan, are identical with my specimens from Afghanistan which appear to be breeders, as the large majority (20 out of 31) were collected from May 17 to August 16 and the others from September 5 to November 5. My specimens from Afghanistan are paler than my topotypical specimens of *hyrcanus*; the chestnut color is not so intense or dark, the gray on top of the head is distinctly lighter and less streaked, and the cheeks are white or only slightly tinged with gray. From *persicus* they differ not only by the color of the cheeks which in *persicus* are always gray, never clear nor ever white, but also by the richer color of the chestnut, and by the slightly but generally darker coloration of the upper parts.

From good series collected from April 29 to August 25 in Kashmir and extreme northern Punjab, the birds of Afghanistan differ by being paler, the chestnut areas in the birds of Kashmir and northern Punjab being considerably darker. The chestnut color is also richer, the nuchal band of chestnut is broader and extends farther down onto the mantle, and in all specimens but one is pure, and does not show an admixture of gray feathers as is almost always present in the birds from Afghanistan. The cheeks are white or only very slightly tinged with gray as in the Afghan birds. The birds of Kashmir and northern Punjab also average slightly larger than those of Afghanistan.

The birds of Kashmir and of the areas north of the outer ranges of the western Himalayas have been described by Whistler as

parkini in 1920 (type locality, Srinagar, Kashmir), the comparison being made with the birds from farther south in India (*indicus*) from which they differ by their considerably larger size, heavier bill, and richer and deeper chestnut.

Meinertzhagen (1938, Ibis, p. 507) and Whistler (1945, Jour. Bombay Nat. Hist. Soc., vol. 45, p. 117) consider that the birds of Kashmir are identical with those of Turkestan and Afghanistan, but I have shown above that the Kashmir birds are distinct, the degree of distinction being certainly as well marked as between any of the races of *P. domesticus* included in this study, and I therefore believe that *parkini* is perfectly valid and should be retained.

Whistler (1945, *loc. cit.*) shows that a specimen of *P. domesticus*, an immature male, collected at Kandahar in southern Afghanistan on April 9, 1881, was named *P. griseigularis* by Sharpe in 1881. He further states that since he cannot see any difference in size or color between the birds of southern Afghanistan and Turkestan, the name *bactrianus* is antedated by *griseigularis*. However, in view of the fact that Whistler failed to distinguish, perhaps owing to insufficient material or material not in comparative state of plumage, between the birds of Kashmir and those of Afghanistan (which I believe can be rather easily separated) I am not convinced that the breeding form of southern Afghanistan is necessarily identical with breeding birds farther north in the mountainous regions of central and northern Afghanistan and Turkestan. Until good breeding series can be compared I follow Meinertzhagen and retain the name *bactrianus* for these latter.

I have another reason for doing so. Kandahar is at the very edge of the southern lowlands, and on the western part of these, at Farah, I have found *persicus*, and presumably *indicus* is the breeding form in Baluchistan. In the lowlands of southwestern Afghanistan the three forms may meet, and the name *griseigularis* cannot therefore be applied with certainty to any. For the time being, *P. griseigularis* must be considered as unidentifiable.

In addition to birds from Kashmir and northern Punjab, I have good series of Indian specimens from Nepal, United Provinces, Bihar, and Central Provinces, a small series from southern India, as well as other scattered Indian specimens. With the exception of the Nepal series, all the other Indian birds (*indicus*) are similar in size and color, that is, lighter in color and con-

siderably smaller than the birds of Kashmir and northern Punjab.

The Nepal series is made up of large birds identical in size with those of Kashmir and northern Punjab, but slightly lighter in color. The chestnut is not quite so dark nor so pure on the back of the neck. However, these Nepal birds are much closer to *parkini* than they are to *indicus*, and since their measurements are identical with those of *parkini*, I think that they are best referred to this form.

Baker (1926, Fauna of British India, vol. 3, p. 169) divided the birds of India, south of the Himalayas, into two forms, on the basis that in the birds south of northern Central India and Bihar the color of the chestnut areas was deeper, the black on the breast more extensive, and the white wing patch purer and larger. These more southern birds he calls *P. d. nigricollis* Burton, 1838. I have seen too few southern Indian birds, but those that I have examined show no constant color difference by which they could be separated from those of northern India, south of the Himalayas. As Whistler (1933, Jour. Bombay Nat. Hist. Soc., vol. 36, p. 838) remarks, the birds from these two regions are identical in size and do not appear to differ in color.

The scattered specimens from Ceylon, Bengal, Assam, and northern Burma are identical in measurements with *indicus*, and there is no apparent color difference.

Another race of *P. domesticus* described by Zarudny and Kudashev is *P. d. semiretschieensis* in 1916 (type locality, according to Hartert, Djarkent and Verni). This form, from the Semirychensk Mountains in the eastern part of Russian Turkestan, is said to resemble *P. d. domesticus* but to be lighter. This is the only character that separates *P. d. biblicus* from *P. d. domesticus*. In the collection of the American Museum of Natural History there are six topotypes from Djarkent, two males and four females, one of the latter being one of Zarudny's specimens. All of these Djarkent birds are paler than *P. d. domesticus* but can be matched perfectly in color and size by typical (including type and topotypes) *biblicus* from Palestine, collected at comparable dates only a week or so apart. Buturlin and Dementiev (1934, L'Oiseau, vol. 4, p. 510) make *semiretschieensis* a synonym of *P. d. domesticus*, but my examination shows that this name should be, instead, a synonym of *biblicus*. As the range of *P. d. domesticus* extends to the north and east of

Turkestan, the birds of the Semiryechensk occupy in the east the same position in the cline in the reduction of pigment represented in the west by *biblicus*.

The name *Passer enigmaticus* was given by Zarudny in 1903 to a sparrow collected by him in Persian Baluchistan. The description of the new form shows that it is exceedingly similar to the female of *P. domesticus*, but differs in that both of the specimens are males and have an admixture of chestnut on the post-ocular stripe, lesser upper wing coverts, and outer webs of the feathers of the mantle.

No other specimens of *enigmaticus* other than these two have ever been found, but in the Koelz collection there are several specimens which, by presenting a mixture of male and female characters, appear to throw a good deal of light on the status of *enigmaticus*. Chief among these are an adult female from Thankot in Nepal, an unsexed adult from Bandipur in Kashmir, and an adult male from Khalat in Afghanistan. Some of these specimens match the description of *enigmaticus* and are discussed elsewhere in detail by Mayr (in press), whose conclusion is that the evidence of these specimens suggests that *enigmaticus* is a freak intersex of *P. domesticus*. As Zarudny's specimens were collected in an area where *persicus* passes into *indicus*, Mayr proposes, and I follow him, that, rather than upset the present nomenclature, the name *enigmaticus* should be placed in the synonymy of *indicus*.

In summary, the forms recognized as valid by this study, with a brief diagnosis of their characters, their ranges, and the measurements of the principal series, follow. The measurements are those of adult males. Color comparisons were made only with male specimens in breeding, that is, worn plumage, but birds in which the plumage was very worn were excluded.

***Passer domesticus biblicus* Hartert, 1910**

SYNONYM: *Passer domesticus semiretschieensis* Zarudny and Kudashev, 1916.

DIAGNOSIS: Lighter than *P. d. domesticus*, cheeks lighter than in *domesticus* but always darker and more solidly gray than in any of the subsequent forms.

RANGE: Palestine and Syria, through Iraq and Kurdestan, up to and including Azerbaijan and western Persia westward from Kazvin, Hamadan, and western Luristan; the region of the Semiryechensk in Russian Turkestan.

MEASUREMENTS

Locality or Region	No.	Wing	Bill
Palestine and Syria through Iraq to Kurdistan	14	78.5-84.0 (81.07)	13.5-15.0 (14.32)
Type of <i>biblicus</i> , ad. ♂ (Sueme, Palestine)	1	81.5	14.0
Gasrishirin and Kermanshah	11	79.0-85.0 (81.45)	13.0-14.5 (14.00)
Azerbaijan	15	79.0-84.0 (82.00)	13.0-14.5 (13.75)
Hamadan	3	82.5-85.0 (83.50)	13.0-13.5 (13.33)
Semirychensk Mts. (Djarkent)	2	80.0, 81.0 (80.50)	14.5, 14.5 —

***Passer domesticus persicus* Zarudny and Kudashev, 1916**

DIAGNOSIS: Paler than *biblicus* and slightly smaller in size, cheeks always gray but of a paler gray.

RANGE: Persia (with the exception of the southern shore of the Caspian) eastward of the range of *biblicus*, as far as and including Khorasan, the lowlands of southwestern Afghanistan, Seistan, and Persian Baluchistan.

MEASUREMENTS

Locality or Region	No.	Wing	Bill
Eastern Luristan (Durud) and Bakhtiari	14	76.0-84.0 (79.90)	12.5-14.0 (13.30)
Eastern Khuzistan	8	76.0-82.0 (79.40)	13.0-14.5 (14.00)
Iran and Yezd	23	76.0-83.0 (79.30)	11.5-14.0 (12.85)
Fars and Laristan	15	77.0-83.0 (79.30)	12.0-13.5 (12.47)
Kirman	16	75.0-80.0 (77.97)	11.0-13.0 (12.10)
Seistan (very worn)	3	73+-76+ (74.70+)	12.5-13.0 (12.83)
Persian Baluchistan	10	74.0-79.0 (77.25)	12.5-14.0 (13.00)
Khorasan	11	73.0-81.0 (76.59)	12.0-13.0 (12.67)

***Passer domesticus hyrcanus* Zarudny and Kudashev, 1916**

DIAGNOSIS: Darker above than *persicus*, chestnut considerably richer and darker, top of crown slightly streaked with black, cheeks very pale with the gray fainter and more restricted.

MEASUREMENTS

Locality or Region	No.	Wing	Bill
Gurgan (topotypical), worn	4	75.0-79.0 (77.00)	12.0-14.0 (13.12)
Tarsakan and Chikishlyar to Resht (Zarudny)	10	74.0-81.0 (78.42)	— — —
Barforush (Babul) to Pahlevi (Stresemann, 1928)	12	73.0-77.0 (75.17)	— — —

RANGE: Southern shore of the Caspian from Tarsakan in southwestern Transcaspia (Zarudny), westward to western Gilan west of Pahlevi.

***Passer domesticus bactrianus* Zarudny and Kudashev, 1916**

DIAGNOSIS: Upper parts lighter than *hyrcanus* but a little darker than in *persicus*, chestnut not so intense nor so dark as in *hyrcanus* and gray on top of the crown lighter and not streaked, cheeks clearer than *hyrcanus*, white or only very slightly tinged with gray.

RANGE: Russian Turkestan except in the northeast, the plains of the Syr-Daria and the Aral Sea, Transcaspia, east of Tarsakan, and Afghanistan except in the lowlands of the south and southwest.

MEASUREMENTS

Locality or Region	No.	Wing	Bill
Central and northern Afghanistan (worn)	9	75.0-79.0 (77.16)	13.0-14.0 (13.28)
Central and northern Afghanistan (fresh)	7	74.0-81.0 (78.80)	

***Passer domesticus parkini* Whistler, 1920**

DIAGNOSIS: Upper parts darker than in *bactrianus* but not quite so dark as in *hyrcanus*, chestnut considerably darker than in *bactrianus*, and on the back of the neck and mantle, purer and more extensive. Chestnut is of a richer color than in any of the preceding forms, cheeks are clearer than in *hyrcanus*, whitish or white as in *bactrianus*.

RANGE: Kashmir, probably Tibet, northern Punjab north of the outer folds of the Himalayas, Nepal above the southern plain.

MEASUREMENTS

Locality or Region	No.	Wing	Bill
Kashmir	12	76.0-82.0 (80.20)	13.0-14.0 (13.50)
Northern Punjab (Kulu and Lahul)	6	74.0-85.0 (79.39)	12.5-13.5 (13.16)
Nepal (Thankot)	7	75.5-81.0 (78.43)	13.0-14.5 (13.80)

***Passer domesticus indicus* Jardine and Selby, 1831**

SYNONYMS: *Pyrgila nigricollis* Burton, 1838.

Passer enigmaticus Zarudny, 1903.

DIAGNOSIS: Considerably smaller than any of the preceding forms, chestnut not so dark nor so rich as that of *parkini*, bill shorter than *parkini*, and less heavy than in any of the preceding forms, general coloration light, cheek patches white.

RANGE: India, south of the Himalayas, Baluchistan, Ceylon, Burma.

MEASUREMENTS

Locality or Region	No.	Wing	Bill
United Provinces (Nichlaul)	7	72.0-76.0 (73.93)	11.5-13.0 (12.07)
Bihar	3	73.0-75.0 (73.66)	12.0-13.0 (12.33)
Surguja	2	71.0, 74.0 (72.50)	12.5, 12.5 —
Northern Central Provinces (Bheraghat)	9	71.5-78.0 (75.44)	12.0-13.0 (12.40)
Southern India (Londa and Nilghiris)	7	70.0-77.0 (74.36)	12.0-13.5 (12.86)
Northern Burma (Bhamo)	2	74.5, 74.5 —	13.0, 13.0 —
Type of <i>indicus</i> , ad. ♂ (Bangalore, Mysore)	1	74.0	12.5

The type locality of *indicus* was fixed as Karachi, Sind, by Baker (1926, Fauna of British India, vol. 3, p. 170). However, Kinnear (1925, Ibis, p. 752) has shown that this locality was arbitrarily chosen and that the type probably came from Bangalore.

In the extensive material of this study the only actual specimens that showed evidence of intergradation (in this case between *biblicus* and *persicus*) were some from western Persia in Bakhtiari, eastern Luristan, and eastern Khuzistan. In Baluchistan proper, from which I had no specimens, *persicus* is replaced by *indicus* as the breeding form. Interesting regions where three forms probably meet are southwestern Transcaspiia for *hyrcanus*, *persicus*, and *bactrianus*, and the lowlands of southern Afghanistan for *persicus*, *bactrianus*, and *indicus*.

***Passer domesticus biblicus* Hartert**

KERMANS SHAH: Kermanshah, December 27, 1940, 1 ad. ♂; Gasrishirin, December 29, 1940-January 1, 1941, 10 ad. ♂, 2 ad. ♀, 7 imm. ♀.

WESTERN IRAN: Kazvin, October 23, 1 ad. ♂; Amirabad, December 19, 1 ad. ♂; Hamadan, December 21-23, 2 ad. ♂, 1 ad. ♀.

AZERBAIJAN: Tabriz, October 10–31, 4 ad. ♂, 1 ad. ♀; Gharibdash, October 25, 1 ad. ♂, 1 ad. ♀; Sarab, November 1, 1 ad. ♂, 1 imm. ♀; Ardebil, November 3–4, 2 ad. ♂, 1 ad. ♀; Namin, November 6, 1 imm. ♀; Livan, November 14, 1 ad. ♀; Sanjbulagh, December 3–5, 3 ad. ♂, 2 ad. ♀; Dashaghi, December 5, 3 ad. ♂, 4 ad. ♀; Khoi, December 10, 1 ad. ♂.

***Passer domesticus persicus* Zarudny and Kudashev**

KHUZISTAN: Ahwaz, April, 22, 1940, 6 ad. ♂; Dizful, April 23 and May 17, 2 ad. ♂.

LURISTAN: Durud, May 21–24, 1940, 1 ad. ♂, 2 ad. ♀, January 23–26, 1941, 3 ad. ♂, 1 ad. ♀, March 9, 2 ad. ♂, May 2, 1 ad. ♂; Burujird, June 19, 1 ad. ♀, September 24, 1 ad. ♂.

BAKHTIARI: Mulikiaulia, April 26, 1940, 1 ad. ♀; Ti, February 1–10, 1941, 7 ad. ♂, 4 ad. ♀, 1 imm. ♀; Imarat, February 16, 1 ad. ♀.

IRAN: Khatumabad, January 31, 1940, 1 ad. ♀; Dehidisk, February 1, 3 ad. ♂; Tomogaon, February 3–7, 5 ad. ♂, 2 ad. ♀; Isfahan, March 3–4, 2 ad. ♂; Sharifabad, October 22, 3 ad. ♂, 1 imm. ♀; Gurveh, October 34, 1 ad. ♂; Karaj, March 25, 1945, 1 ad. ♂, July 17, 1 imm. ♀, October 29–November 7, 3 ad. ♂, 1 ad. ♀. Yezd: Shir Kuh, Dehibala, February 21–25, 1945, 4 ad. ♂, 2 ad. ♀.

FARS: Surmag, March 7, 1940, 2 ad. ♂, 2 ad. ♀; Eglit, March 8, 1 ad. ♂; Persepolis, March 12, 3 ad. ♂, 1 ad. ♀; Shiraz, March 15 and April 7, 2 ad. ♀; Jahrum, March 25, 1 ad. ♂; Istanbul, March 27, 1 ad. ♂; Niriz, March 30, 4 ad. ♂, 3 ad. ♀; Borazjan, April 11, 1 imm. ♀.

LARISTAN: Isin, December 16–19, 1939, 1 ad. ♂, 2 ad. ♀; Bandar Abbas, December 21, 2 ad. ♂.

KIRMAN: Madenu, December 27–28, 1939, 4 ad. ♂; Dehibala, January 7, 1940, 1 ad. ♂; Khabis, January 13, 1 ad. ♂; Chaharfarsakh, January 15, 2 ad. ♀; Dehishib, January 17, 1 ad. ♀; Kirman, January 18–20, 5 ad. ♂, 1 ad. ♀; Paibene, February 14, 1 ad. ♂; Darzin, February 15, 1 ad. ♀; Maskun or Mahun, February 16, 3 ad. ♂, 1 ad. ♀.

KHORASAN: Bujnurd, August 2–8, 1940, 1 ad. ♂, 1 imm. ♀; Karak, August 7, 1 ad. ♂; Bardu, August 16–21, 3 ad. ♂, 3 ad. ♀; Bijistan, August 26, 1 ad. ♂; Firdaus, August 29–30, 2 ad. ♂, 1 imm. ♂, 2 ad. ♀, 1 imm. ♀; Robatikhan, September 3, 1 imm. ♂; Gunabad, September 9, 1 ad. ♂, 1 ad. ♀; Sultanabad, September 22, 1 imm. ♂.

SOUTHWESTERN AFGHANISTAN: Farah, October 30, 1937, 1 ad. ♂.

***Passer domesticus hyrcanus* Zarudny and Kudashev**

SOUTHERN CASPIAN, MAZENDERAN: Gorgan (Astrabad), July 27–30, 1940, 3 ad. ♂, 2 ad. ♀, October 1, 2 ad. ♂, 2 imm. ♀.

***Passer domesticus bactrianus* Zarudny and Kudashev**

AFGHANISTAN: Kabul, May 17, 1937, 1 ad. ♂, 2 ad. ♀; Laghman, May 25, 1 ad. ♂; Nazhil, May 29, 1 ad. ♂; Gardez, June 15–20, 1 ad. ♂, 1 ad. ♀; Nozi, June 22, 2 ad. ♂, 2 ad. ♀; Tagan, June 8, 1 ad. ♂; Sirotai, June 20, 1 ad. ♀; Baghlan, July 1, 2 ad. ♂; Khanabad, July 2, 1 ad. ♀; Gumbaz, Kishm,

July 7, 1 ad. ♀ ; Zebak, July 20–21, 1 ad. ♀ , 1 imm. ♀ ; Tuti, August 16, 1 imm. ♀ ; Balkh, September 5, 2 ad. ♂ , 1 ad. ♀ ; Aq Chah, September 8, 1 ad. ♂ ; Bagrami, September 28–29, 2 ad. ♀ ; Khalat, October 14, 1 ad. ♂ ; Tuksar, September 16, 1939, 1 ad. ♂ ; Dehmiana, September 17, 1 ad. ♂ ; Pul i Khumri, November 5, 1 imm. ♀ .

***Passer domesticus parkini* Whistler**

KASHMIR: Bandipur, July 30, 1936, 2 imm. ♂ , 1 unsexed ad. ; Gurais, August 3, 1 ad. ♂ . Baltistan: Safaranga, August 18, 2 ad. ♂ , 1 ad. ♀ , 1 imm. ♀ ; Kafalu, August 21–27, 2 ad. ♂ , 2 imm. ♀ ; Dagoni, August 24–25, 1 ad. ♂ , 3 ad. ♀ ; Khalan, August 30, 1 imm. ♀ ; Biodkang, September 3, 1 ad. ♂ , 1 imm. ♂ , 1 ad. ♀ ; Udmaro, September 6, 1 imm. ♀ ; Hundi, September 7, 5 ad. ♂ , 3 ad. ♀ , 1 imm. ♀ ; Karzong, September 13, 1 ad. ♂ . Ladakh: Shyok Valley, Kampuk, September 8, 1936, 1 ad. ♀ ; Pitug, September 19–20, 1936, 4 ad. ♂ , 1 imm. ♂ ; Spituk, September 21, 1 imm. ♂ , 2 ad. ♀ , 2 imm. ♀ ; Gya, September 25, 1 ad. ♂ .

NORTHERN PUNJAB: Kulu: Bandrole, June 1, 1936, 1 ad. ♂ . Lahul: Kolung, June 16, 1 ad. ♂ ; Koksar, August 25, 2 ad. ♂ , 1 ad. ♀ ; Kyelang, October 19, 1 ad. ♀ .

NEPAL: Thankot, March 31–April 12, 1947, 7 ad. ♂ , 4 ad. ♀ .

***Passer domesticus indicus* Jardine and Selby**

UNITED PROVINCES: North: Nichlaul, January 31–February 15, 1947, 6 ad. ♂ , 4 ad. ♀ ; south: Benares, January 23, 1 ad. ♂ .

SOUTHERN BENGAL: Dacca, January 16, 1937, 2 ad. ♂ .

BIHAR: Muhammadganj, August 28–September 2, 1947, 3 ad. ♂ , 2 ad. ♀ .

SURGUJA: Ramanujganj, October 9–10, 1947, 2 ad. ♂ .

CENTRAL PROVINCES: Bheraghat, March 5–26, 1946, 4 ad. ♂ , 1 ad. ♀ , December 3–19, 5 ad. ♂ , 3 ad. ♀ ; Bichhia, July 9–14, 2 ad. ♂ , 1 imm. ♂ , 2 ad. ♀ .

SOUTHERN INDIA: Southern Bombay Presidency, Londa, January 1–March 13, 1938, 4 ad. ♀ . Madras Presidency: Nilghiri Hills, Ootacamund, February 18, 1937, 1 ad. ♂ ; Cuddapah, March 30, 1 ad. ♂ .

***Passer hispaniolensis transcaspicus* Tschusi**

PERSIA: Bakhtiari, Sar i Dasht, April 27, 1940, 3 ad. ♂ . Mazenderan, Gurgan, October 1, 1 imm. ♂ . Kermanshah, Gasrishirin, January 1–9, 1941, 6 ad. ♂ , 7 ad. ♀ . Luristan, Durud, April 2–9, 3 ad. ♂ , 6 ad. ♀ .

AFGHANISTAN: Bagrami, September 29–October 1, 1937, 3 ad. ♂ , 1 ad. ♀ ; Kandahar, October 23, 1 ad. ♀ .

In breeding plumage this race is extremely close to, and cannot with certainty be separated from, the nominate race in similar plumage, though the chestnut of the crown in *transcaspicus* is not quite so rich. In winter plumage, however, the two are quite distinct; *transcaspicus* is paler, less rusty and lighter above, and

the edges of the outer webs of its wing and tail feathers are considerably lighter than in *hispaniolensis*.

There are no differences in color or size between the specimens from Persia and those of Afghanistan. A male of typical *transcaspicus* collected on January 27 at Tedshen, Transcaspia, matches perfectly the color of my January specimens from western Persia, and its size is identical.

My specimens of *P. hispaniolensis* and *P. domesticus* collected together in Persia and Afghanistan show no evidence whatsoever of hybridization.

MEASUREMENTS: Wing: 15 males, 78.5–85.0 (81.13); 15 females, 74.0–81.0 (77.24). Tail: 14 males, 49.0–60.0 (54.50); 15 females, 48.0–55.0 (51.64). Bill: 15 males, 13.0–15.0 (13.85); 15 females, 13.0–14.0 (13.37).

PASSER MONTANUS

The series of the Tree Sparrow collected by Koelz consist of 124 specimens. A study of this material together with the collection of the American Museum of Natural History shows that the Koelz specimens represent three forms. These three subspecies can be distinguished from one another by their coloration. The differences are best appreciated on the upper parts, particularly the mantle and the rump. These three races are:

Passer m. transcausicus Buturlin, 1906. The more western series from northern Persia collected in Azerbaijan, at Karaj, and in the mountains above Gurgan differs from a series of typical *P. m. montanus* from western Europe in being duller above, a little lighter, grayer and less rufous, and by having the center of the belly whiter, and the bill slightly shorter. These characters agree well with the description of *transcausicus* whose range is given by Buturlin and Dementiev (1935) as Transcaucasia and the southern shores of the Caspian.

The measurements of the three races, together with those of a series of *P. m. montanus*, are given below. The only difference which may be of significance is the shorter bill of *transcausicus*. *P. m. dilutus* appears to have the wing and tail a little longer than the others, but seen as a whole the size differences are too slight to be of use in discrimination.

Passer m. dilutus Richmond, 1895. This race, whose type locality is Kashgar in Eastern (Chinese) Turkestan, was described as being considerably paler everywhere than *P. m. montanus*.

My material from eastern Persia (Khorasan) and that of Afghanistan is identical in size with, and shows no significant difference in color from, a series from Djarkent in the eastern part of Western (Russian) Turkestan, and with three specimens from Khotan in Eastern Turkestan. All the specimens, both above and below, are paler than *transcausicus* and considerably paler than *montanus*, *transcausicus* being intermediate between *dilutus* and *montanus*. But if only isolated specimens of *transcausicus* are compared to others of *dilutus*, particularly from the more western part of the range of this latter, they are seen to differ very little.

The birds from eastern Persia (the western extremity of the range of *dilutus*) were called *pallidus* by Zarudny in 1903. Snigirewski (1928, Jour. Ornith., vol. 76, p. 591) states that *pallidus* differs from *dilutus* by having a shorter tail and wing, and by being grayer, particularly on the rump. The measurements given below fail to confirm this size difference. The rump on my three Eastern Turkestan specimens is perhaps very slightly paler than in my birds from eastern Persia, but the difference is so minute that, lacking other characters (such as the size), I think *pallidus* cannot be maintained.

Passer m. malaccensis Dubois, 1885. My series from Nepal is darker and decidedly more reddish above than my specimens of *dilutus* and is brighter as well as more reddish than my specimens of *transcausicus*. These Nepal birds do not differ in either color or size from other series of *malaccensis* from the Indo-Chinese countries and Hainan, as well as from scattered specimens from the Greater Sundas and the Malay Peninsula (including topotypical *malaccensis* from Malacca). But though *malaccensis* is distinctly different from *dilutus* and *transcausicus*, it is, on the other hand, extremely close to *montanus*. I cannot see any difference in the color of the under parts between my specimens of *montanus* from western Europe and those of *malaccensis* from Nepal and the other regions given above. In the color of the upper parts there is a very slight color difference, but only as a series, the difference being really perceptible only on the rump, which in *malaccensis* averages a little more rufous. The differences in the measurements appear to be too slight to be of significance. The question whether or not *malaccensis* is really separable from *montanus* can be settled only by more abundant and fresher series than are available to me. These

series should consist of birds in comparative plumage representing all the various stages of wear, for with wear the crown in all the specimens of *P. montanus* that I have examined turns redder, and the color of the mantle and rump more rufous.

The ranges of *P. m. transcausicus* and *P. m. dilutus* in Persia and Afghanistan are shown in figure 1. Localities reported by Zarudny and Härms, Stresemann, Paludan, and Whistler are included. Although some of the localities of Zarudny and Härms, and Whistler, as well as several of mine from Afghanistan, could not be found, they all fall within the ranges indicated on the map.

The distribution follows in a striking manner the trend of the northern mountains, the species being lacking entirely on the Persian Plateau and in the lowlands of southwestern Afghanistan.

MEASUREMENTS

Region or Locality	No.	Wing	Tail	Bill
<i>P. m. montanus</i>				
Western Europe	11	65.0-72.0 (68.60)	46.0-50.0 (48.46)	12.0-13.0 (12.36)
<i>P. m. transcausicus</i>				
Northern Persia	19	66.0-72.5 (68.67)	47.0-56.0 (51.10)	10.5-12.0 (11.10)
<i>P. m. dilutus</i>				
Eastern Persia				
(Khorasan)	5	71.0-76.5 (74.10)	51.0-60.0 (55.70)	12.5-13.0 (12.50)
Baluchistan	4	73.0-73.5 (73.25)	50.0-54.5 (53.00)	12.0-12.5 (12.12)
Afghanistan	21	72.0-77.0 (73.90)	50.0-59.0 (54.30)	11.5-13.0 (12.12)
Western				
Turkestan				
(Djarkent)	8	70.0-77.0 (73.30)	52.0-56.0 (53.70)	12.0-13.5 (12.50)
Eastern				
Turkestan				
(Khotan)	3	72, 73, 75 (73.34)	54, 55, 56 (55.00)	12.5, 13, 13 (12.83)
<i>P. m. malaccensis</i>				
Nepal	6	70.5-73.5 (72.50)	47.0-56.5 (52.92)	12.5-14.0 (13.16)
Indo-Chinese				
countries	7	68.0-71.5 (69.80)	47.5-54.0 (51.00)	12.5-13.5 (13.00)
Hainan	9	68.0-72.5 (70.22)	48.0-52.0 (50.28)	12.5-13.8 (13.22)

Passer montanus transcausicus Buturlin

AZERBAIJAN: Tabriz, October 30-31, 1940, 2 ad. ♂, 2 ad. ♀, 1 imm. ♀, 1 unsexed ad., December 14, 1 ad. ♂; Ardebil, November 2, 1 ad. ♀; Sarab, November 8, 1 ad. ♂, 2 ad. ♀; Maraghe, November 25-December 1, 5 ad. ♂, 2 ad. ♀; Rezaieh, December 8, 1 unsexed ad.

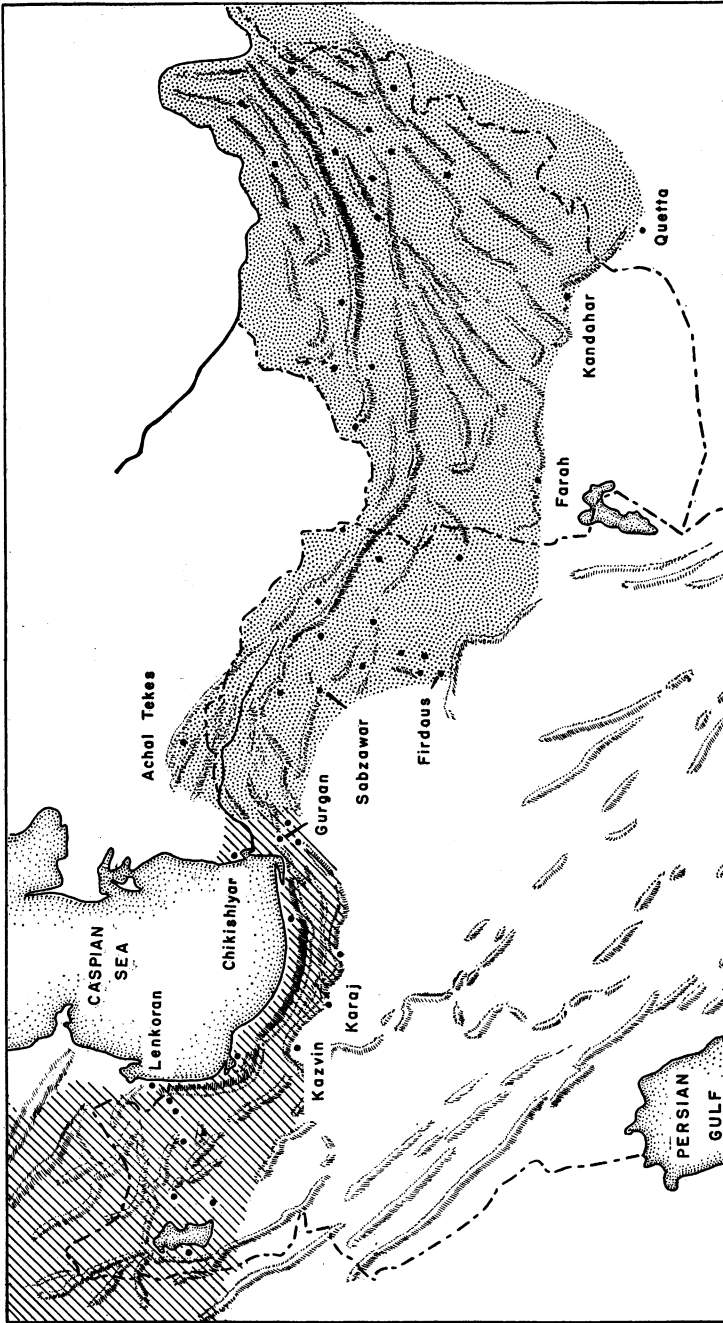


FIG. 1. Range of *Passer montanus* in Persia and Afghanistan. Diagonal lines: *P. m. transcaucasicus*. Stippling: *P. m. dilutus*.

MAZENDERAN: Rubatikarim, July 16, 1940, 1 ad. ♂; Shah Kuh, July 20, 1 imm. ♂; Karimserai, July 20-22, 2 ad. ♂, 2 imm. ♂, 2 ad. ♀, 5 imm. ♀; Dimalu, July 22, 1 imm. ♀.

NORTHERN IRAN: Karaj, February 19, 1943, 1 ad. ♀, March 1, 1944, 2 ad. ♂, December 8, 1 ad. ♂, October 20-November 18, 1945, 4 ad. ♂, 5 ad. ♀.

***Passer montanus dilutus* Richmond**

Synonym: *Passer montanus pallidus* Zarudny.

NORTHEASTERN PERSIA, KHORASAN: Garmah, August 3, 1940, 3 imm. ♂, 1 ad. ♀; Firdaus, August 30, 1 ad. ♂, 1 imm. ♂, 1 ad. ♀; Gunabad, September 9, 1 ad. ♂, 1 imm. ♂; Turbati Haidari, September 12, 1 ad. ♂; Nishabur, September 20, 3 ad. ♀; Sultanabad, September 22, 1 ad. ♂, 1 ad. ♀; Sabzawar, September 23, 1 ad. ♀.

BALUCHISTAN: Quetta, November 26-27, 1939, 1 ad. ♂, 1 ad. ♀; Spezand Junction, January 19, 1946, 3 ad. ♂, 1 ad. ♀.

AFGHANISTAN: Gulbahar, May 14, 1937, 2 ad. ♀; Laghman, May 25-26, 2 ad. ♂; Gardez, June 15-16, 1 ad. ♂, 1 ad. ♀; Khanabad, July 2-3, 1 ad. ♀, 1 nestling ♂ and 1 nestling ♀; Faizabad, July 12, 1 ad. ♂; Sanglech, July 27, 1 ad. ♂, 2 nestling ♂; Bagrami, September 28-October 1, 2 imm. ♀; Laorlash, October 7, 1 ad. ♀; Mukur, October 10, 1 ad. ♂; Karabagh, October 10, 3 ad. ♂; Farah, November 7-9, 3 ad. ♂, 2 ad. ♀; Bala Murghab, November 15, 1 ad. ♂; Maimana, November 16-18, 3 ad. ♂, 3 ad. ♀; Kabul, December 14, 2 ad. ♂, 2 ad. ♀; Jalalabad, December 19, 1 ad. ♂; Doao, August 23, 1939, 1 unsexed imm.; Bai, September 19, 1 imm. ♂; Sufak, September 27, 1 ad. ♂, 1 imm. ♂, 3 ad. ♀.

INDIA, NORTHWEST FRONTIER PROVINCE: Parachinar, May 7-8, 1936, 2 ad. ♂.

***Passer montanus malaccensis* Dubois**

NEPAL: Bhimpedi, March 11-13, 1947, 2 ad. ♂, 1 ad. ♀, May 3, 1 ad. ♂; Chitlang, March 15, 1 ad. ♀; Thankot, April 8-29, 3 ad. ♂, 2 ad. ♀.

***Passer rutilans cinnamomeus* Gould**

NORTHERN PUNJAB: Kulu, Bandrole, May 31, 1936, 1 ad. ♂; Kangra, Kotla, January 27, 1946, 2 ad. ♂.

The length of the wing measures: 72, 72, 73.5. In other adult male specimens from the collection of the American Museum of Natural History, the same measurement is: northern Punjab, 72, 72.5, 75, 75; Ladakh, Kashmir, 71, 72, 72, 72, 72.5, 72.5, 73, 73.

Hartert in 1910 (*Die Vögel der paläarktischen Fauna*, vol. 1, p. 162) separated the birds of the Himalayas west of Nepal as *P. r. debilis* on account of their being somewhat smaller and lighter in color above than the birds found from Nepal eastward.

But Kinnear (1922, Ibis, p. 521) later showed that there is no constant color difference and no significant size difference between the western and eastern Himalayan populations.

On the other hand the populations from the high plateau of southern Tibet, as well as from northern Bhutan and probably northern Sikkim, have been shown by Stresemann (1939, Ornith. Monatsber., vol. 47, p. 176) to be considerably larger than the more southern birds in the Himalayas. A series of 19 adult males of this larger race, which Stresemann calls *P. r. schaeferi*, measure for the wing 77–82 (78.5), as against 71–75 (72.67) for 15 adult males from Kashmir and northern Punjab.

In my specimens the wing in five adult males from Sikkim and Bhutan measures: Sikkim, 74+ (very worn), 77, 78.5; Bhutan, 77.5, 80. Unfortunately no further localities are given, but the measurements of the unworn birds fit within the range of variation of *schaeferi*.

With wear the whole plumage turns distinctly lighter, the lower parts become paler, and the bright chestnut red of the upper parts turns into a rusty orange. The type of *P. r. debilis* was collected on July 19, 1873, and is in extremely worn and faded plumage, which probably accounts for the difference in color seen by Hartert.

***Passer pyrrhonotus* Blyth**

PUNJAB: Lahore, November 29, 1936, 2 ad. ♂.

This little sparrow is found locally in Sind and Punjab and has been collected twice in southern Persian Baluchistan during March by Zarudny and Härms.

MEASUREMENTS: Wing: 68.0, 69.0; tail: 47.0, 50.5; bill: 11.5, 12.0.

Three additional adult specimens from the collection of the American Museum of Natural History measure: one male, January 25, Lahore, wing 67, tail 50.5, bill 11.5; one male, no date or locality, Sind, wing 68, tail 48, bill 11.5; one female, no date, eastern Narra, Sind, wing 65, tail 48, bill 11.5.

Montifringilla nivalis

Two races of *Montifringilla nivalis* were collected by Koelz, *M. n. alpicola* and *M. n. gaddi*. *Montifringilla n. gaddi*, probably owing to insufficiency of comparative material, has been hitherto

considered to be only a synonym of *M. n. alpicola*. Our extensive series, however, which contains specimens in all states of plumage, now amply confirms its validity.

Montifringilla n. gaddi was described as having a longer bill, blacker lores, paler plumage, and the white areas of the tail more developed than in typical *M. n. alpicola* from the Caucasus. Our specimens do not bear out the difference in the bill length, nor that of the darkness of the lores, a character which appears to be connected with the state of the plumage. But *gaddi* is whiter below, and paler, more rufous, and less gray above than *alpicola*. It also has larger white areas in the tail feathers, as well as on the inner primaries, than in *alpicola*.

In coloration, *M. n. gaddi* is similar to another hard to distinguish race, *M. n. groum-grzimaili* from eastern Tian Shan and southeastern Altai, but *gaddi* shows more white on the tail and inner primaries.

As the three races are very close to one another, they are summarized below. Five adult males in comparative seasonal plumage are used. The bill length, taken from the skull, is given, as this measurement is mentioned by various authors. The black terminal spot is that of the fifth inner pair of rectrices and is measured, on whichever side it is greater, to the tip of the feather.

1. *Montifringilla nivalis alpicola* Pallas (Iran, Karaj, January 18). Darker and grayer than *M. n. gaddi*.

MEASUREMENTS: Wing: 117, 119, 120, 121, 122 (119.80); bill: 16, 16, 16, 16, 17.5 (16.30); terminal spot: 9, 10, 10, 11, 11 (10.20).

2. *Montifringilla nivalis gaddi* Zarudny and Loudon (Luristan, Durud, four, and Bakhtiari, Ti, one, January 24–February 14). Paler and more rufous than *M. n. alpicola*.

MEASUREMENTS: Wing: 116, 118, 119, 122, 122.5 (119.50); bill: 15.5, 15.5, 16, 16, 16.5 (15.90); terminal spot: 4, 5, 6, 6, 7 (5.60).

3. *Montifringilla nivalis groum-grzimaili* Zarudny and Loudon (Tian-Shan, Naryn, January 14–16). Color as in *M. n. gaddi*.

MEASUREMENTS: Wing: 115, 118, 120, 121, 124 (119.60); bill: 15, 15, 15.5, 16, 16.5 (15.60); terminal spot: 8, 9, 9, 11, 12 (9.80).

The measurements of the specimens (adults only) collected by Koelz are as follows (specimens from Afghanistan not included):

Montifringilla n. alpicola: Wing: 10 males, 117.0–122.0 (118.90); four females, 110.0–115.0 (112.0). Tail: seven males, 66.0–71.0 (68.92); three females, 62, 66, 72 (66.0). Bill, from skull: 10 males, 16.0–17.5 (16.35); four females, 15.0–16.5 (15.88).

Montifringilla n. gaddi: Wing: 19 males, 116.0–126.0 (119.34); four females, 112.0–116.0 (114.25). Tail: 18 males, 68.0–76.0 (71.50); five females, 65.0–71.0 (68.50). Bill: 18 males, 15.0–17.5 (16.20); five females, 15.0–16.0 (15.60).

The specimens from Afghanistan have not been used for comparison. They are similar in coloration to *gaddi* and *groumgrzimaili*, but in one of the three adult males from Afghanistan the white area on the primary coverts is more restricted, and in the other two it is very much reduced and so much suffused with dark as to be almost lacking.

The reduction in the white area may be characteristic of the birds of Afghanistan, as it is shown by all my specimens, but as it also occurs in an occasional specimen of all the other three races, I think it best, for lack of more material, to refer my Afghanistan specimens to *gaddi*.

***Montifringilla nivalis alpicola* Pallas**

AZERBAIJAN: Livan, November 18, 1940, 1 ad. ♀. Iran: Karaj, January 18, 1945, 6 ad. ♂, 1 ad. ♀, 3 unsexed ad. Mazenderan: Shah Kuh, July 18–19, 1940, 4 ad. ♂, 5 imm. ♂, 2 ad. ♀.

***Montifringilla nivalis gaddi* Zarudny and Loudon**

LURISTAN: Durud, January 22–25, 1941, 5 ad. ♂, March 15–22, 7 ad. ♂, 3 ad. ♀, August 28, 1 imm. ♂, October 25, 1 ad. ♂, 1 ad. ♀; Khali Kuh, June 1, 1940, 4 ad. ♂, 1 imm. ♂, 1 ad. ♀, 2 imm. ♀. Bakhtiari: Ti, February 9–14, 1941, 2 ad. ♂.

AFGHANISTAN: Shanbashak, August 31, 1939, 2 imm. ♀; Safedsang, September 20, 1 imm. ♂; Burchao Pass, October 10–12, 3 ad. ♂, 1 ad. ♀.

***Montifringilla adamsi adamsi* Adams**

KASHMIR: Ladakh, Shakrot, September 26, 1936, 1 imm. ♀.

This immature specimen measures: wing 95.0, tail 52.0, bill 12.5. According to Stuart Baker (1926, Fauna of British India, vol. 3, p. 187), adults measure: wing 102.0–103.0, tail 61.0–70.0, bill 12.0–14.0.

Montifringilla theresae Meinertzhagen

NORTHERN AFGHANISTAN: Sabz Pass, August 28, 1939, 4 ad. ♂, 4 ad. ♀.

All the specimens are in full moult. In the only specimen in which the wing could be measured, an adult female, the length is 88.0. The length of the bill is, in males, 14.0–15.0, and that of females 13.0–15.0. The wing length of Meinertzhagen's specimens was: five males, 93.0–99.0; two females, 89.0 and 91.0.

When discovered, *M. theresae* was found to be breeding on top of the Shibar Pass in northern Afghanistan in company with a *M. nivalis* said by Meinertzhagen to have been *M. nivalis adamsi*. Stegmann (1932, Jour. Ornith., vol. 80, p. 99) has shown that *M. nivalis* and *M. adamsi* are two distinct species. The range of *M. adamsi* does not extend so far west as Afghanistan, and in Meinertzhagen's subsequent report on the birds of northern Afghanistan (1938, Ibis, p. 505), the *M. nivalis* in whose company *theresae* was breeding is identified as *M. n. alpicola*. I have shown in the discussion of *M. n. gaddi* that *alpicola* does not extend to northern Afghanistan, but that the *M. nivalis* of that region seems to belong to another form, which may or may not be distinct from *gaddi*, but in any case is not *alpicola*.

In size and in the pattern of the wing and tail, *M. theresae* belongs in a group made up, in addition to itself, of *M. ruficollis* and *M. blanfordi*. This group differs from the larger *M. nivalis* and *M. adamsi* by a different distribution and much larger amount of dark on the secondaries and rectrices.

In *nivalis* and *adamsi*, the outer rectrices are all white except for small dark tips. All the secondaries in *nivalis* are all white; in *adamsi* only the distal half of the two or three innermost are white, the outermost being white on the inner web and dark on the outer. In *theresae*, *ruficollis*, and *blanfordi* the amount of white varies in each, but all the secondaries on both webs are either dark or end in dark tips, and the rectrices are largely suffused with gray and end in very large dark tips, separated by a narrow or wide white band.

Based on a progressive reduction of white, the order of the species within the two groups appears to be as follows:

Group with much white, larger body size:

1. *M. nivalis*
2. *M. adamsi*

Group with little white, smaller body size:

1. *M. ruficollis*
2. *M. theresae*
3. *M. blanfordi*

Montifringilla blanfordi blanfordi Hume

KASHMIR: Rupshu, Tozeri, October 2-3, 1936, 20 ad. ♂, 2 imm. ♂, 11 ad. ♀, 4 imm. ♀. Northern Punjab: Lahul, Seschu, October 6, 1 ad. ♂.

Four of the adults have just finished moulting, and in the others the moult is just being completed. The immatures are just starting to moult into adult plumage. All the adults are therefore in very fresh plumage. When compared with two worn specimens collected on June 28 at Iso Kor, Rupshu, these June birds have the chin and forehead mark a little blacker than the fresh specimens and are also a little grayer above and below.

The measurements, in adult specimens that have finished moulting or in those in which the feathers used for measurements appear to be fully grown, are as follows: wing, 12 males, 95.0-101.0 (97.66), eight females, 94.0-97.0 (95.30); tail, 12 males, 49.0-55.0 (51.67), nine females, 45.0-50.0 (48.45); bill, 20 males, 10.0-12.0 (10.90), 11 females, 10.0-11.5 (10.95).

The range of *M. b. blanfordi* is southern Tibet and the Himalayas from Kashmir to Sikkim. Two additional races have been described, both from northeastern Tibet: one, *M. b. barbata* Przewalski, 1887, from northwestern China (Kansu) to southern Kuku Nor, east of Zaidam; the other, *M. b. ventorum* Stegmann, 1932, from the "Valley of the Winds" in the Tschamen-tagh, west of Zaidam. Neither is available for examination; *barbata* is said to be grayer above and to lack the rusty tinge of *blanfordi*, and *ventorum* is said to be paler gray above and more yellowish black than *barbata*.

Ploceus philippinus philippinus Linnaeus

PUNJAB: Lahore, February 11, 1933, 1 ad. ♂. Nepal: Thankot, April 11, 1947, 1 ad. ♂, June 27-July 25, 10 ad. ♂, 1 ad. ♀. United Provinces: Benares, January 22-24, 1947, 2 ad. ♂, 1 ad. ♀; Nichlaul, February 1-6, 4 ad. ♂, 3 ad. ♀; Kalnahi, February 18, 1 ad. ♂, 1 ad. ♀; Lucknow, December 11, 1 ad. ♂. Bihar: Muhammadganj, August 21-September 2, 1947, 8 ad. ♂, 2 ad. ♀; Garhwa Road, September 15, 1 imm. ♂. Surguja: Ramanujanj, November 7, 1947, 1 imm. ♂, 1 imm. ♀. Southern Bengal: Dacca, January 13-17, 1937, 2 ad. ♂, 2 ad. ♀. Central Provinces: Bheraghat, March 1-26, 1946, 6 ad. ♂, 1 ad. ♀, April 26-May 27, 2 ad. ♂, 2 ad. ♀, December 29, 1 imm. ♀; Mandla, June 21, 1 ad. ♂, October 14, 2 ad. ♂, 1 imm. ♂.

The specimens show that this form undergoes two moults a year, a prenuptial and a postnuptial moult. The prenuptial moult is partial; only the feathers of the upper part of the body are renewed, producing in the male the yellow and dark feathers of the breeding season. In the postnuptial moult every feather of the body is changed; the males lose all the colored feathers, and in this eclipse plumage are identical with the females.

The prenuptial moult takes place in the spring. In my specimens from Bheraghat in northern Central Provinces, collected from March 1 to May 27, the first evidence of this moult is on a specimen collected on April 26. In the specimens from Thankot in Nepal, a male from April 11 has not started the moult, but in the rest of the series collected from June 27 to July 25 all the males are in full breeding plumage, with the exception of four June birds in which the moult is from one-half to two-thirds complete. All the Thankot birds, excepting the one from April, are marked "breeding" on the label. Farther south, at Muhammadganj in Bihar, a series collected from August 21 to September 2 is also in full breeding plumage. Throughout the breeding season the whole plumage, with the exception of the nuptial feathers, is very badly worn, and the color of the bill in the males is black.

The height of the breeding season appears to be July and August. It may extend into September, though I believe that the postnuptial moult probably begins towards the end of that month or in the beginning of October. Unfortunately, I have only one adult specimen from September 2 to December 11. In this specimen, collected on October 14 at Mandla, northern Central Provinces, the yellow feathers have almost completely been replaced, but the rest of the plumage, though exceedingly worn, has not begun to moult. I have four immature specimens collected during this season (September 15 to October 14) in Bihar and northern Central Provinces. These, three males and one female, are in fresh juvenal plumage, both sexes are identical, and their color, both above and below, is very tawny.

The wing and tail feathers are the last to be replaced, for in my only two specimens in which the wing is moulting (January 19, Londa, and January 24, Benares), the rest of the body plumage has been completely renewed and, though still very fresh, is beginning to show slight signs of wear. The whole plumage is at its freshest from the middle of December to the

middle of February and wears progressively from then onward.

A color comparison made with specimens in fresh or slightly worn plumage shows that the birds from western India are paler, grayer, and less tawny than the birds of eastern and southern India. The palest and least tawny specimen is from Lahore, and the darkest and tawniest are a single specimen from Londa in southern Bombay and several from Dacca in southern Bengal. In the intervening region the birds are intermediate: specimens from Bheraghat in northern Central Provinces; Kheri, Kalnahi, and Nichlaul in northern United Provinces; and Thankot in Nepal are closer to the pale bird from Lahore, while the specimens from Lucknow and Benares are quite close to the birds of Dacca. This trend is definite, although I have too few specimens to be able to express it numerically. As Whistler mentions (1933, Jour. Bombay Nat. Hist. Soc., vol. 36, p. 832), the birds from Benares eastward to Dacca will probably be found to intergrade with the tawnier race (*Ploceus philippinus burmanicus*) of the eastern Himalayas, Assam, and northern and central Burma.

MEASUREMENTS: (Fresh or slightly worn adult specimens only.) Wing: 13 males, 70.0–77.0 (73.0); six females, 71.0–73.0 (71.84). Tail: 13 males, 43.0–52.0 (46.34); six females, 43.0–48.0 (45.0). Bill: all adults, 41 males, 17.0–19.5 (17.94); 13 females, 16.5–18.5 (17.50).

***Ploceus philippinus travancorensis* Whistler**

SOUTHERN BOMBAY PRESIDENCY: Londa, January 18, 1938, 1 ad. ♂.

The single specimen from Londa, mentioned above, is identical in the coloration of the upper parts with the specimens from Dacca, but the under surface of the body is darker. The tawny wash is more pronounced, its shaft streaks are darker and better defined, and the wash covers the whole abdomen instead of being limited to the breast and flanks as in all my other specimens of *philippinus*. These characters match exactly those given in the description of *Ploceus philippinus travancorensis*. This new race was described by Whistler from breeding specimens collected at Kottayam on the backwaters of the Travancore coast below Cochin (1936, in Ali, Jour. Bombay Nat. Hist. Soc., vol. 38, p. 504). This new specimen from Londa extends considerably the range of *P. p. travancorensis* along the west coast of India.

The distribution of the dark forms of *P. philippinus* (*P. p. travancoreensis* and *P. p. birmanicus*) is reminiscent of the distribution of the Great Indian Hornbill (*Dichoceros bicornis*) and that of the Frogmouths of the genus *Batrachostomus*, as illustrated by the maps of Ali (1935, Jour. Bombay Nat. Hist. Soc., vol. 37, p. 823).

MEASUREMENTS: Londa: adult male: wing, 72; tail, 42; bill, 17.5. Kottayam (Ali and Whistler): four adult males: wing, 70–75; tail, 41.5–48.0; bill, 18–20. One adult female: wing, 72.5; tail, moult; bill, 20.

***Ploceus manyar flaviceps* Lesson**

PUNJAB: Keshapur, March 7, 1931, 1 ad. ♂. Sind: Khinjar Lake, February 4, 1934, 1 ad. ♂.

These two specimens and two others also from Keshapur, collected at the same time as my specimens, constitute all the material available to me. Since these four specimens were collected not long after the complete postnuptial moult, they are in fresh or slightly worn plumage. The four specimens are identical above, but below they are somewhat different. The three Punjab birds are paler, less heavily streaked, and the shaft steaks are narrower than in the specimen from Sind. These are exactly the characters given by S. Baker as distinguishing *P. manyar striatus* from *P. manyar flaviceps* (1926, Fauna of British India, vol. 3, p. 73). However, in view of the slowness of the differences, additional material is required before *striatus* can be recognized as a valid form.

MEASUREMENTS: Punjab, Keshapur: two adult males: wing, 69, 72; tail, 44.5, 45.5; bill, 19, 19.5. One female: wing, 65; tail, 42; bill, 18. Sind, Khinjar Lake: one adult male: wing, 74; tail, 45.5; bill, 19.

***Ploceus benghalensis* Linnaeus**

NORTHERN UNITED PROVINCES: Nichlaul, February 13, 1947, 1 ad. ♀: Kalnahi, February 24, 2 ad. ♂.

These three specimens are in fresh, or slightly worn, winter plumage. Both sexes are identical.

MEASUREMENTS: Wing: male, 70.5, 73; female, 71. Tail: male, 42, 44; female, 44. Bill: male, 16, 16.5; female, 16.

***Lonchura malabarica malabarica* Linnaeus**

SOUTHERN PERSIA: Laristan, Isin, December 17-18, 1939, 2 ad. ♂, 2 ad. ♀.

INDIA: Sind: Soneri Lake, December 5-7, 1939, 1 ad. ♂, 1 ad. ♀. Northern Punjab: Kangra, Kotla, February 3, 1946, 1 ad. ♂. United Provinces: Lucknow, December 10-11, 1936, 2 ad. ♂, 1 ad. ♀; Siswa Bazar, January 30, 1947, 1 ad. ♀; Nichlaul, January 31, 1 ad. ♂; Kalnahi, February 15, 2 ad. ♂. Bihar: Bhagahaghat, February 28, 1947, 1 ad. ♀; Muhammadganj, August 22-September 3, 5 ad. ♂, 2 ad. ♀. Central Provinces: Bheraghat, March 11-May 10, 1946, 3 ad. ♂, 2 imm. ♂, 5 ad. ♀, 1 imm. ♀. Madras Presidency: Rati, January 29, 1937, 1 ad. ♂; Sidhout, March 22, 1 ad. ♂; Hospet, March 25, 1 ad. ♂.

This is one of the Indian species whose range extends into southeastern and southern Persia. Ticehurst (1925, Jour. Bombay Nat. Hist. Soc., vol. 30, p. 728) reports a specimen collected on April 7, 1921, on Tanb Island at the eastern end of the Persian Gulf. As most of the island is barren, this specimen, which was the only one seen, is believed to have been a stray. My specimens from Laristan were collected at Isin, 9 miles north of Bandar Abbas, and represent so far the most western record of the species on the mainland.

These four specimens are slightly paler than specimens from India in comparative plumage. The primaries and rectrices are not so dark, brownish rather than blackish, and the rusty edges on the upper surface of the central rectrices are broader. These feathers also appear to be slightly shorter, less pointed, more rounded at their tips than in the Indian specimens. However, this last character may not be reliable, as the shape of the tips of these feathers varies in the Indian specimens, and the soft thin point of the feather is quickly worn off.

My material from Persia is insufficient, but the differences between these specimens and those of India, though slight, deserved to be mentioned. In the rest of the series from the various parts of India I can see no difference in coloration between birds in comparative plumage, and there are no significant size differences, as can be seen below.

MEASUREMENTS: (Fresh or slightly worn adult specimens only.)

Persia: Tail: male, 43, 46; female, 46, 49. Wing: male, 55, 57; female, 55, 56.

Sind: Tail: male, 45. Wing: male, 55; female, 55.5.

United Provinces: Tail: male, 51. Wing: male, 55.

Bihar: Tail: male, 47, 47, 48, 48, 50; female, 54, 57. Wing: male, 54, 54, 54.5, 55, 56; female, 54, 57.

Central Provinces: Tail: male, 45; female, 45, 46. Wing: female, 56, 56.

Madras: Tail: male, 51. Wing: male, 56.

Bill length: Persia: male, 10, 11; female, 10, 11. India: 18 males, 10.0–11.0 (10.25); 11 females, 10.0–11.0 (10.18).

***Lonchura striata acuticauda* Hodgson**

NEPAL: Hetora, May 13, 1947, 1 ad. ♂.

This form differs from the more southern race, *striata* (type locality, Ceylon), by being browner, by being marked with fine blackish squamations on the abdomen and flanks, and by having more prominent shaft streaks. In *striata*, the feathers of the throat and upper breast are pure black, whereas in *acuticauda* (type locality, Nepal) these feathers are brown, end in rufous edges, and are marked with fine shaft streaks.

This specimen is in very worn condition, and the feathers of the throat and top of the head are moulting.

***Lonchura striata striata* Linnaeus**

SYNONYM: *Lonchura striata estriata* Koelz.

NORTHERN MADRAS PRESIDENCY: Mahendra, January 25–26, 1937, 1 ad. ♂, 1 imm. ♂, 1 imm. ♀. Southern Madras Presidency: Nilghiri Hills, Kunjapanai, February 20, 1 imm. ♀; Nilambur, March 2, 1 ad. ♀. Southern Bombay Presidency: Londa, January 7–February 14, 1938, 3 ad. ♂, 5 ad. ♀, 1 imm. ♀; Jagalbed, February 22–24, 1 ad. ♂, 1 ad. ♀, 1 ad. ♀ (the type of *L. s. estriata*). Northern Central Provinces: Belwani-Kisli, August 2–8, 1946, 1 ad. ♂, 2 ad. ♀, 2 unsexed ad., September 25, 3 ad. ♂; Bichhia, August 7, 1 ad. ♀.

Lonchura s. estriata is based on the series from Londa and Jagalbed in southern Bombay and the specimen from Nilambur. In the type and two or three of the other specimens the shaft streaks are to a varying degree less prominent than in the typical specimens of *striata* from Ceylon in the Rothschild collection. The black of the southern Bombay specimens is a little more intense and the white is purer than in the Ceylon specimens, but these are old foxed skins dating from 1875 and 1893. In four fresh specimens collected in December, 1939, at Seringapatam in Mysore by Ali, the coloration is identical to that of the southern Bombay birds. The shaft streaks of the Mysore birds are as well marked as in the Ceylon specimens. The Mysore

birds are identical to my good series from the central Northern Provinces. Whistler (1942, Jour. Bombay Nat. Hist. Soc., vol. 43, p. 36) found that the specimens in the British Museum from southern India, including some to the north and south of the type locality of *estriata*, could not be separated from typical *striata* of Ceylon. Though the population in the Londa neighborhood shows a tendency towards a reduction in the prominence in the shaft streaks, the specimens from this series cannot be separated as a whole from my other specimens from southern India and Ceylon.

The adult specimen from Mahendra confirms Whistler's observation (1933, Jour. Bombay Nat. Hist. Soc., vol. 36, p. 834) that the birds from the northern end of the Eastern Ghats are intermediate between *acuticauda* and *striata*. This specimen is browner on the back, ear coverts, and shorter upper tail coverts, and has more prominent shaft streaks on its back than in *striata*. Below, although its appearance is closer to that of *striata*, it shows very faint shaft streaks on the throat and traces of blackish squamation on the flanks and lower abdomen.

Breeding birds can be found at different seasons of the year. In my series, specimens collected while breeding were taken at Londa in southern Bombay from January 31 to February 11, and on September 25 at Belwani-Kisli in northern Central Provinces. The moult follows the breeding season but can start apparently while the birds are still breeding. The wing moults first and is followed by the crown and upper throat. All of the specimens from southern Bombay and the one from southern Madras collected from January 7 to March 2 and the birds from Central Provinces collected from August 2 to September 25 are in worn plumage. In one-third to one-half of the specimens from both regions (including the breeding birds in both cases) the moult has started with the feathers of the wing, while that of the rest of the body, with the exception of a few feathers on the crown and upper throat, has not begun. At Mahendra, on January 25, an immature specimen is moulting into the adult plumage.

MEASUREMENTS: (Badly worn specimens are not included.) Wing: five males, 53.0–55.0 (54.20); seven females, 52.0–54.5 (53.14). Tail: five males, 39.0–45.0 (41.50); four females, 38.0–41.5 (40.25). Bill (all adults): nine males, 12.0–13.0 (12.27); 10 females, 12.0–13.0 (12.45).

***Lonchura ferruginosa atricapilla* Vieillot**

SYNONYM: *Munia rubroniger* Hodgson.

NEPAL: Hetora, August 1, 1947, 1 ad. ♀.

The birds of Nepal were called *Munia rubroniger* by Hodgson in 1836, but the older name of this form is *Loxia atricapilla* Vieillot, 1805, the type locality of which was restricted to lower Bengal by Robinson and Kloss (1924, Jour. Nat. Hist. Soc. Siam, vol. 5, p. 362). The measurements given by these authors show that there is no difference in size between the birds of Nepal (wing length of 12 specimens, 53–56), and those of peninsular Siam (seven specimens, 52–56). My specimens from the collection of the American Museum of Natural History, from Nepal, measure 55, 55, 56 (55.33), and 13 others from the intervening regions between Nepal and peninsular Siam, 54–57 (54.96). My specimens also show that the amount of black on the abdomen varies individually, a fact already noticed by Chasen and Kloss in their specimens from the north of the Malay Peninsula (1929, Bull. Raffles Mus., no. 2, p. 23).

The specimen collected at Hetora on August 1 was in the act of laying. Its plumage is quite worn.

***Lonchura punctulata lineoverter* Hodgson**

NORTHERN PUNJAB: Kangra: Kangra, November 22–23, 1936, 1 ad. ♂, 2 ad. ♀; Kotla, January 26–27, 1946, 1 imm. ♂, 1 imm. ♀. Nepal: Amlekhganj, March 6, 1947, 1 imm. ♀; Thankot, March 30, 1 imm. ♂; Hetora, June 13–July 6, 2 ad. ♂, 6 ad. ♀. United Provinces: Lucknow, December 11, 1936, 1 ad. ♂, 1 ad. ♀; Siswa Bazar, January 30, 1947, 1 ad. ♂, 1 imm. ♂; Nichlaul, February 1–7, 2 imm. ♂, 2 ad. ♀, 1 imm. ♀; Kalnahi, February 20, 1 ad. ♀, November 19, 1 imm. ♂; Khada, February 27, 1 unsexed ad. Southern Bengal: Dacca, January 13–16, 1937, 2 ad. ♀. Bihar: Garhwa Road, September 15, 1947, 1 ad. ♀. Surguja: Ramanujganj, October 7–November 9, 1947, 3 ad. ♂, 2 imm. ♂, 1 imm. ♀; Gargori, October 20, 1 ad. ♀. Central Provinces: Bheraghat, March 24–April 26, 1946, 3 ad. ♂, 1 ad. ♀?; Kanha, August 11–September 5, 4 ad. ♂, 3 ad. ♀; Belwani-Kisli, August 31, 1 ad. ♂, September 24, 1 ad. ♀. Southern Bombay Presidency: Londa, January 7–February 18, 1938, 5 ad. ♂, 3 imm. ♂, 4 ad. ♀, 4 imm. ♀; Jagalbed, February 18–23, 1 ad. ♂, 2 imm. ♂, 1 ad. ♀.

As shown by Ticehurst (1937, Jour. Bombay Nat. Hist. Soc., vol. 39, p. 557), the correct name of this form is *lineoverter* Hodgson, 1836 (type locality, Nepal), and not *punctulata* Linnaeus, 1766, the type locality of which had been fixed as Java in 1789.

The series includes specimens from every month of the year except May. Comparison of the specimens in fresh or not too badly worn plumage fails to show any color difference between birds from northern Punjab, Nepal, United Provinces, Bihar, and Central Provinces. The specimens from southern Bengal and southern Bombay are in the last stages of wear and are not comparable. The males average a little darker than the females, both above and below. In the females, the crown and mantle are grayer, the maroon color of the throat is not so rich, and the edges of the feathers of the breast and flank are a little browner. There are no size differences between my specimens of the various populations.

The plumage is renewed by a complete postnuptial moult, and there is no eclipse plumage. Unfortunately, no notes were recorded as to the breeding condition, with the exception of two specimens collected in the act of laying at Kanha on August 15, and September 24 at Belwani-Kisli, both localities in northern Central Provinces. The breeding season probably varies in different parts of India, as specimens in various stages of moult are found from the end of November to the end of April. In my specimens, birds taken from August 11 to October 20 are in worn plumage and show no evidence of moult. These specimens, which include the two breeding birds, were collected in Bihar, Surguja, and northern Central Provinces. The first evidences of moult are in birds taken at the end of November in northern Punjab, the moult starting with the secondaries and inner primaries. At Dacca in southern Bengal, a bird from January 16 has not started to moult, but in another taken on January 13 the moult is starting with the secondaries. Birds from December 11 to February 7 in United Provinces, January 27 to February 23 in southern Bombay, and March 24 to April 26 from Bheraghat in northern Central Provinces are in the midst of the moult, the wing feathers and body plumage moulting simultaneously. During this season, immature specimens from United Provinces and southern Bombay are moulting into adult plumage, the first adult feathers appearing on the throat, breast, and flanks. In my specimens the only adults in really fresh plumage are June and early July birds from Nepal.

MEASUREMENTS: (Badly worn specimens are excepted.) Wing: 10 males, 54.0–57.5 (55.65); 15 females, 53.0–58.0 (55.33). Tail: six males, 40.0–45.0 (42.60); seven females,

38.0–45.0 (40.50). Bill (all adults): 23 males, 11.0–12.5 (12.0); 24 females, 11.0–12.5 (11.85).

***Estrilda amandava amandava* Linnaeus**

UNITED PROVINCES: Saharanpur, December 1, 1936, 2 ad. ♂; Nichlaur, February 4–14, 1947, 1 ad. ♂, 2 imm. ♂; Kalnahi, February 17–24, 2 ad. ♂, 1 imm. ♂, 1 ad. ♀, 1 imm. ♀. Central Provinces: Bheraghat, April 22–May 2, 1946, 2 ad. ♂, 2 imm. ♂, 6 ad. ♀, December 5–21, 1 ad. ♂, 1 ad. ♀, 2 imm. ♀; Belwani-Kisli, July 26, 2 ad. ♂, 2 ad. ♀, September 25–29, 4 ad. ♂; Bichhia, July 5–15, 3 ad. ♂, October 5, 1 ad. ♂; Kanha, September 16, 1 ad. ♂.

The races of this species have been illustrated in color and have been discussed in detail by Delacour (1935, L'Oiseau, p. 377). The nominate race is found throughout India, Ceylon, and Assam.

This series gives a good illustration of the moult. As is well known, the adult male in this species assumes the brown plumage of the female after the breeding season and reverts again to the red plumage preparatory to the breeding season. My specimens show that this prenuptial moult is a complete moult, and that the postnuptial moult is partial and involves only the replacement of the red feathers.

In my specimens, two adult males collected on February 4 and 17 in United Provinces are well advanced or have turned completely into the eclipse plumage, but their wing and tail show no signs of moult. In Central Provinces, birds of both sexes collected from April 22 to July 26 are in full moult, the moult of the wing and tail feathers being far more advanced than that of the body plumage. Examination of these specimens shows that on April 22 an adult male is moulting the wing and tail but that there are no signs of any red feathers. In another from July 7 the moult of the tail has been completed and that of the wing is far advanced, but only a few pin points of red feathers, appearing on the crown and face, are breaking through their sheaths. This is also true of four other adult male specimens collected from July 5 to 26. In these the moult of the tail has been completed and that of the wing is advanced but that of the body feathers is lagging behind to a varying degree. Two immature males, also from April 22, are moulting into adult plumage, the first adult feathers appearing in the wing in one case and in the wing and tail in the other. From September 16 to December 5 in Central Provinces, and December 1 in United Provinces, all

my adult specimens are in the full red breeding plumage, the intensity of the red varying somewhat individually. Following the breeding season I have no specimens from Central Provinces between December 5 and April 22, but, as mentioned above, two adult males taken in early February in United Provinces are turning or have turned into the eclipse plumage.

MEASUREMENTS: (Badly worn specimens or specimens in which the feather is not fully grown are excepted.) Wing: 13 males, 47.0–50.5 (48.30); four females, 47.0–48.0 (47.60). Tail: 15 males, 36.0–41.0 (37.73); four females, 35.0–38.0 (36.50). Bill (all adults): 18 males, 10.0–10.5 (10.20); 10 females, 9.5–10.5 (10.04).

