

American Museum Novitates

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CENTRAL PARK WEST AT 79TH STREET, NEW YORK 24, N.Y.

NUMBER 1805

DECEMBER 7, 1956

Systematic Notes on Palearctic Birds. No. 23 Fringillidae: the Genera *Emberiza*, *Calcarius*, and *Plectrophenax*

BY CHARLES VAURIE

The following notes were made during a study of the above genera for a contemplated check list of the birds of the Palearctic region. They are concerned chiefly with the genus *Emberiza* in which 15 of the species are discussed. Among these, *E. cia* is reviewed in greater detail, as it is the species that exhibits the greatest degree of geographical variation with the exception of *E. schoeniclus*. A review of this last species is presented in a separate paper in the present series.¹

Material was lent by several institutions, and I have also benefited by the comments and advice of Drs. D. Amadon and F. Salomonsen. For their cooperation in making me loans I am grateful also to Mr. J. C. Greenway of the Museum of Comparative Zoölogy, Mr. J. D. Macdonald of the British Museum (Natural History), and Drs. J. Van Tyne and R. W. Storer of the Museum of Zoology of the University of Michigan. The specimens from the University of Michigan were collected by Dr. W. Koelz.

Emberiza calandra

The Corn Bunting has been divided by Meinertzhagen (1947, Bull. Brit. Ornith. Club, vol. 67, p. 91) into three subspecies: *clanceyi* which he described as new in that paper with type locality, Aran Islands, western Ireland; nominate *calandra* Linnaeus, 1758, type locality, Sweden;

¹ 1956, Amer. Mus. Novitates, no. 1795.

and *buturlini* Herman Johansen, 1907, type locality, Semirechia. A very large series that I have examined shows that a cline of decreasing saturation runs eastward from the British Isles through Europe to Asia, but that the geographical variation is rather slight. Perhaps for this reason the "Birds of the Soviet Union" (1954, vol. 5, p. 377) does not recognize *buturlini*, synonymizing this name with nominate *calandra*, but I am inclined to agree with Meinertzhagen that it is valid. In the specimens examined, those from Asia are constantly paler throughout than those of Europe, grayer above, more whitish below, and in fresh plumage the pale edges and the tips of the tail feathers are or tend to be whiter. In addition, these birds show a tendency to be less heavily streaked on the throat and flanks, and this character becomes more apparent as the populations range farther east in Asia. Nevertheless, as emphasized above, the sub-specific characters of *buturlini* are relatively slight. This race is said to be larger than nominate *calandra*, but this is not confirmed by my specimens. In 20 adult males of each race taken at random the wing length is virtually identical, measuring 98–105 (102) in the 20 from Europe and 96–107 (102.5) in the 20 from Asia.

Meinertzhagen described *clanceyi* as more richly colored, redder above and more yellow below, than nominate *calandra* and implied that all the populations of the British Isles belong to this new form, though he states, "Typical birds have only been seen from the extreme west of Ireland, and from west Scotland." His emphasis throughout is on the characters of the birds of western Ireland, and none from this region are available to me, but the series I have compared from the British Isles to one from Sweden and western continental Europe differs only very slightly, and the difference is not constant. The difference is best shown in specimens from the Outer Hebrides, but again it is one of average only. There is no doubt that the population of the British Isles stands at the opposite end of the cline of decreasing saturation from *buturlini*, but in my opinion it is not sufficiently well differentiated from topotypical nominate *calandra* to warrant its separation. As stated, no specimens from the extreme west of Ireland were available, but it seems to me that very little would be gained by recognizing a separate race restricted only to the coastal region of western Ireland, and I follow the opinion of the official "Check-list of the birds of Great Britain and Ireland" (1952, London, British Ornithologists' Union, p. 98) which has synonymized *clanceyi* with nominate *calandra*.

Two other forms (*thanneri* Tschusi, 1903, type locality, Canaries, and *parroti* Görnitz, 1921, type locality, Corsica) are mentioned by Mein-

ertzhagen, who says they are not sufficiently constant to warrant separation. These forms are recognized by Hartert and Steinbacher (1932, *Die Vögel der paläarktischen Fauna*, suppl. vol., p. 86), but several authors besides Meinertzhagen have questioned them. *Thanneri* is alleged to have darker and coarser streaks above and below than nominate *calandra*, while *parroti* is said to be darker and duller than nominate *calandra* and less brownish than *thanneri*, but the specimens of the latter and of *parroti* that I have examined confirm that these two forms are not separable from nominate *calandra*. Only an occasional specimen among them differs along the lines indicated, and the difference is very slight.

Emberiza citrinella

Until 1940, only two races of the Yellow Bunting were recognized: nominate *citrinella* Linnaeus, 1758, type locality, Sweden, in the western part of the range including the British Isles; and the paler *erythrogenys* C. L. Brehm, 1855, type locality, Sarepta on the lower Volga, in the eastern part of the range.

In 1940, Clancey (*Ibis*, p. 94) described an additional race which he called *caliginosa* with type locality, northern Scotland. The chief character of this new race is that it is darker and richer in coloration and more heavily streaked than nominate *citrinella*. Clancey (1948, *Bull. Brit. Ornith. Club*, vol. 68, pp. 105–107) has defined its range as: "Scotland and Isles, Ireland, Isle of Man, Wales, northern and western districts of England. Ranging to Ushant, Finistère, France." The description of this race precipitated a series of notes in the *Bulletin of the British Ornithologists' Club* and the *Ibis* by Clancey, Meinertzhagen, and the List Committee of the British Ornithologists' Union (by the latter in 1950, *Ibis*, pp. 133–134). The final result, which followed the views of Meinertzhagen (1947, *Bull. Brit. Ornith. Club*, vol. 67, pp. 91–93), was to reject *caliginosa* as invalid but to revive *nebulosa* Gengler, 1920, type locality, "England, Holland and North France," according to Meinertzhagen, and restricted by him to Stalham, Norfolk, southeastern England, with range [apparently] the whole of the British Isles.

This decision to recognize *nebulosa* is not supported, however, by the large series of specimens I have examined. In these, an occasional specimen from southeastern England is somewhat darker or more richly colored than topotypical nominate *citrinella*, but the difference is extremely slight, and almost all of the specimens, whether in fresh or in worn breeding plumage, are identical. Included are specimens from Norfolk and other southeastern counties such as Middlesex, Surrey, Kent, and

Sussex. I therefore consider *nebulosa* to be a synonym of nominate *citrinella*.

I have examined only a few specimens from the range of *caliginosa* as defined by Clancey, but among these are four specimens from Scotland which all show the differences mentioned by Clancey and suggest that *caliginosa* is a recognizable race. It is true that they are not very sharply differentiated from specimens from southeastern England or Sweden, but they are about as well differentiated from the latter as are two topotypes of *erythrogeus*, and they are very sharply differentiated indeed from specimens from the eastern end of the range of *erythrogeus* and of the species in Asia. It is, then, probably desirable to reflect this variation in the nomenclature and to recognize three subspecies, even though the populations from the range occupied by the nominate race and from the type locality of *erythrogeus* are intermediate to a varying degree along the cline of decreasing saturation which runs from west to east in this species. The alternative, but less satisfactory solution, in view of the fact of the sharp difference which prevails at opposite ends of the range, is not to recognize any subspecies at all.

The clinal variation makes it impossible to define where *erythrogeus* replaces nominate *citrinella*. Dementiev (1934, L'Oiseau, p. 515) and the "Birds of the Soviet Union" (1954, vol. 5, pp. 382-390, and map 67) refer the populations of northern and western Russia to nominate *citrinella* and those from central Russia and the Ukraine eastward to *erythrogeus*. This division seems to be sound, because a series that I have examined from Pskov and odd specimens from Moscow and Latvia are certainly very close to, if not virtually identical with, specimens from Sweden. Some authors state that *erythrogeus* replaces nominate *citrinella* as far west as East Prussia, but, although a good series that I have examined from this region begins to depart from specimens from Sweden by being slightly paler and more grayish above and less greenish on the hind neck and mantle, it is still much closer to specimens from Sweden than it is to ones from Sarepta, the southern Urals, and especially from Asia. A series from Warsaw is identical with the one from East Prussia, and I find also that specimens from the Balkans are closer to nominate *citrinella*, although the population of this last region has been referred also to *erythrogeus*.

The material examined consists of 336 specimens. The larger series are from the British Isles with 116 specimens, the majority from the southeastern counties mentioned; Sweden, 16; East Prussia, 15; Germany, 68; Warsaw, 10; western Russia, 25, southern Urals, 12; Iran, 28; and Asia other than Iran, 11.

Emberiza leucocephala

Only two subspecies of the Pine Bunting appear to be valid: nominate *leucocephala* S. G. Gmelin, 1771, type locality, Astrakhan, with range that of the whole species, with the exception of the population of north-eastern Tsinghai and Kansu described as *fronto* by Stresemann in 1930. In *fronto* the black bands on the crown of the males are broader, especially on the forehead, the chestnut areas are usually slightly darker, and the wing averages somewhat longer. Meise (1937, Jour. Ornith., vol. 85, p. 481) states that the wing length of 12 males of *fronto* is 93, 95–100.5 (96.9), whereas in 14 nominate *leucocephala* measured by me from Siberia it is 89–96 (93.3).

Two other races have been described but appear to be invalid: one from the Tian Shan by Boetticher (1935, Folia Zool. Hydrobiol., vol. 8, p. 150) as *stachanowi*, and the other from Transbaicalia and Amurland as *karpovi* by Zarudny (1913, Messenger Ornith., p. 94). According to von Jordans (1937, Anz. Ornith. Gesell. Bayern, vol. 2, pp. 404–405) *stachanowi* is based on two winter visitors to the Tian Shan which he found upon examination to be typical specimens of nominate *leucocephala*. Thirteen specimens collected in the winter in the Tian Shan that I have examined are nominate *leucocephala*. The breeding of this species in this region has been questioned, and it may not breed in the region of Naryn, the type locality of *stachanowi*. However, in view of the fact that Ludlow (1933, Ibis, p. 670) found a nest at Mointa in the Tekes Valley of the Tian Shan in Chinese Turkestan, it may breed farther west to the region of Naryn. Whether or not the birds of the Tian Shan belong to a distinct race can be ascertained only by a comparison of breeding birds, but in any case the name *stachanowi* cannot be used, as it is based on visitors of nominate *leucocephala*.

Johansen (1944, Jour. Ornith., vol. 92, pp. 68–69) states that specimens from the eastern end of the range in Siberia are larger and recognizes *karpovi*. His measurements and mine show so much overlap, however, that I do not believe *karpovi* is valid. There are no differences in coloration, and its validity, as also that of *stachanowi*, has been rejected by the "Birds of the Soviet Union" (1954, vol. 5, p. 390).

Wing length of males measured by me: western Siberia, 90, 94, 96; eastern Siberia (Lake Baikal and Yakutia), 89, 91, 93, 94, 94, 96; eastern Siberia (Amurland and one migrant from Ussuriland), 92, 93, 93, 95, 96. Males measured by Johansen: western Siberia and the Altai, 90–94 in 20; central and eastern Siberia, 92–98 in 18; Yakutia, 91–97 in seven; no averages given.

Emberiza melanocephala and *Emberiza bruniceps*

The breeding range of the Black-headed Bunting (*melanocephala*) and that of the Red-headed Bunting (*bruniceps*, the *luteola* or *icterica* of authors) meet only in eastern Iran at the southeastern corner of the Caspian, *melanocephala* replacing *bruniceps* to the west. In this region the two birds hybridize freely, a situation that has been discussed by Paludan [1940, in Jessen, Knud, and R. Spärck (eds.), Danish scientific investigations in Iran, Copenhagen, pt. 2, pp. 33–38] who gives a good color plate of the hybrids. He states that he was not able to detect any difference whatever in their behavior or ecological requirements or to distinguish between their songs. He concludes that because they hybridize freely he prefers to consider them conspecific. In support of this opinion, one may add that they have an intricate and unique molt which runs parallel in both (see Ticehurst, 1940, *Ibis*, pp. 523–525) and that Stresemann (1924, *Ornith. Monatsber.*, vol. 32, p. 43) has remarked that, except for size, the females and young, and even the eggs, are identical.

Nevertheless, these two buntings are considered to be separate species by virtually every author, and I believe also that they are probably not conspecific. The males are strikingly dissimilar in several respects in their pattern and in the nature of their pigments. These differences are well known, but, although the fact has not been emphasized, both sexes differ also structurally. Their proportions are similar, but *melanocephala* is more robust in general build, larger in every measurement, has a more attenuated and somewhat longer bill, and a more pointed wing tip. The differences in measurements as shown by 10 adult males of each are: *melanocephala*, wing 93–98 (94.2), tail 68–74 (71.4), tarsus 19.5–21 (20), bill from nostril 10–11.5 (11), as against in *bruniceps*, wing 85–90 (88.2), tail 65–72 (67.5), tarsus 18–19.5 (18.9), bill 9–10 (9.4).

The wing formula is the same (1, 2, 3 subequal > 4), but the shape of the wing tip is not. In *melanocephala*, the first (outer) primary is slightly the longest in 1, 2, 3, whereas the reverse is true in *bruniceps*; and in *melanocephala* the gap between 3 and 4 is about twice as wide as in *bruniceps*. These differences are slight, varying from 2 to 5 mm., but quite apparent in specimens with the tips of the feathers intact. It is possible that the more pointed wing tip can be accounted for by the greater distance covered by *melanocephala* on its migration which at its greatest covers 7000 kilometers from Istria to peninsular India,¹ but the distance

¹For a very interesting study of the migration of *E. melanocephala* and the speed at which it travels, see Stresemann (1944, *Ornith. Monatsber.*, vol. 52, pp. 85–92).

traveled by *bruniceps* is not small. At its greatest the bird must travel 5000 kilometers from the region north of the Caspian Sea to peninsular India. If *bruniceps* were conspecific with *melanocephala*, one might expect it to have the more pointed rather than the more blunt wing tip, because it breeds at higher latitudes and, generally speaking, also at higher altitudes.

Meinertzhagen (1954, *Birds of Arabia*, London, Oliver and Boyd, pp. 114-115) states that *melanocephala* breeds "east to Afghanistan" but avoids it on passage. However, as stated above, its breeding range ends at the southeastern corner of the Caspian and therefore stops far short of the west of Afghanistan. If it extended to Afghanistan its breeding range and that of *bruniceps* would be sympatric in northeastern Iran over a wide region of some 600 kilometers, but all the evidence so far available shows that the breeding ranges do not overlap, though they may do so slightly in the zone of contact where the two birds hybridize. The main migration takes place through Mekran in southern Baluchistan, but a few individuals travel farther north through Afghanistan. One is reported by Whistler (1945, *Jour. Bombay Nat. Hist. Soc.*, vol. 45, p. 121) from southern Afghanistan collected on April 24, and I have examined one collected on July 29 in the northeast. This date seems a little early, but apparently the fall migration starts early, beginning towards the end of July in Mekran, according to Ticehurst (1927, *Jour. Bombay Nat. Hist. Soc.*, vol. 31, p. 868).

Emberiza aureola

The Yellow-breasted Bunting breeds from northeastern Europe eastward to Anadyrland, Kamchatka, Ussuriland, and Hokkaido. It has been divided into four subspecies, but two are very poorly differentiated and I do not recognize them, following the opinions of Kozlova (1933, *Ibis*, p. 74), Dementiev and Ptuschenko (1940, *Bull. Soc. Nat. Moscou*, sect. biol., vol. 49, pp. 115-122), and the "Birds of the Soviet Union" (1954, vol. 5, pp. 410-417). The two valid races are nominate *aureola* Pallas, 1773, type locality, Irtysh River, with *suschkini* Stanchinsky, 1929, type locality, western Mongolia, as a synonym; and *ornata* Shulpin, 1928, type locality, southern Ussuriland, with *kamtschatica* Stanchinsky, 1929, type locality, Kamchatka, as a synonym.

The nominate race extends from Europe eastward to Anadyrland and to about the upper Amur and is replaced by *ornata* in Kamchatka and from Amurland eastward. It is a distinctly paler bird than *ornata*, the males are duller yellow below, with the black and chestnut areas of the plumage less dark, and are not so heavily and darkly streaked on

the flanks; the females are duller and paler yellow below and tend to be less heavily and darkly streaked above.

My material of the two forms described by Stanchinsky is very scanty, and I quote the opinion of Kozlova who has examined a large series. She states: "I have . . . come to the conclusion that this species has only one distinct race—*ornata* Shulpin. Both other races—*suschkini* and *kamtchatica* . . . can be distinguished with some difficulty and only in large series of adult males. All females and males in their first and second dress are indistinguishable from the typical *aureola*." In the specimens available to me, two from northern Mongolia are about intermediate between nominate *aureola* and *ornata* but on the whole closer to the former. Specimens from Anadyrland are identical with nominate *aureola*, while one from Gizhiga and four from Bering are closer to *ornata*.

Emberiza elegans

A short review of the Yellow-throated Bunting was published by Sushkin (1925, Proc. Boston Soc. Nat. Hist., vol. 38, pp. 29–30) in which he recognized three subspecies: nominate *elegans* Temminck, 1835, type locality, Japan; *elegantula* Swinhoe, 1870, type locality, Hupeh; and a new race which he described as *sibirica*, type locality, southern Ussuriland. In 1926, he proposed for the latter the new name *ticehursti*, because Gmelin in 1789 had cited an *Emberiza sibirica* in the synonymy of *aureola* Pallas, 1773.

The three races differ in their degree of saturation; *ticehursti* is the palest and *elegantula* the darkest. To me they appear to be perfectly valid, although *ticehursti* has been considered a synonym of nominate *elegans* by several authors.

The only form that breeds in China is the very dark *elegantula* which appears to be resident in the mountains or highlands from Shensi to Yunnan. My specimens of this race were collected in the same localities throughout the year, with the exception of three collected between 6000 and 7000 feet in northeastern Burma on January 13 and March 29 and 30. In view of the fact that *elegantula* breeds not far across the border in Yunnan, is a highland form, and does not appear to be migratory, these may have been local birds.

During the fall, winter, and spring two other forms seem to occur in China, because the specimens examined can be separated in both sexes by the differences cited by Sushkin in the description of *sibirica* [i.e., *ticehursti*]. In the dark form (nominate *elegans*) the chestnut edges on the feathers of the mantle and inner secondaries are darker, these feathers have darker centers, the nape and rump are darker gray, and the flanks

are more heavily streaked with dark brown than with rusty streaks. I believe the paler form is *ticehursti*, not only because its characters correspond to the description of that form but also because specimens in fresh plumage are identical with ones in similar plumage collected on September 16–28 in Ussuriland. The difference between the two races is clear cut also in specimens in partly worn plumage. Specimens in this plumage collected around the first of April in Ussuriland are distinctly paler than specimens taken around the middle of March in China which I believe are nominate *elegans* collected before it had started on the spring migration. Finally, although only one specimen of this form in worn plumage is available to me (from Japan), the difference is clear also in this plumage as it is darker than specimens in identical plumage from Ussuriland and Amurland.

La Touche (1927, A handbook of the birds of eastern China, London, Taylor and Francis, p. 355) states that nominate *elegans* is resident in Japan, but it is obvious that this race is migratory, and it is not certain that it breeds at all in Japan. Austin and Kuroda (1953, Bull. Mus. Comp. Zool., vol. 109, p. 596) state that although the 1942 "Hand-list of the Japanese birds" says the species breeds in Hokkaido there seems to be no evidence that it does so. The specimen in worn plumage from Japan mentioned above is not helpful, as it has no date or definite locality. It is possible that the breeding range of nominate *elegans* is restricted to Korea and Manchuria. I have no specimens from these regions, and the papers by Meise on Manchuria (1934, Ber. Mus. Dresden, vol. 18, no. 2, p. 22) and Austin on Korea (1948, Bull. Mus. Comp. Zool., vol. 101, pp. 261–262) are not helpful, for these authors do not recognize *ticehursti*.

All the pale winter visitors (*ticehursti*) examined by me from China are from Hopeh or Shantung, with the exception of one from Shanghai. Whether or not *ticehursti* winters in any numbers south to the Yangtze is uncertain. La Touche (*loc. cit.*) states that *sibirica* [= *ticehursti*] winters south to Fukien, adding "exact southern limits unknown."

Emberiza spodocephala

The various populations of the Black-faced Bunting can be divided into three groups, two of which are homogeneous. In one group (*sordida* Blyth, 1844, type locality, Nepal, the *melanops* of authors) the populations are darkest and have a blacker and more extensive facial mask. This race is isolated from the other two groups by a wide gap in northern China, from Manchuria to Kansu, Szechwan, and Hupeh. In the second group (*personata* Temminck, 1835, type locality, Japan), which is re-

stricted to Sakhalin, southern Kuriles, and Japan and is therefore also well isolated geographically, the throat is yellow, not green. These two races are homogeneous and have a larger bill and a somewhat longer wing than the populations of the third group (for which I recognize only one race, nominate *spodocephala* Pallas, 1776, type locality, Transbaikalia). In 10 adult males of each, the wing length is 70–77 (73.5) in both *sordida* and *personata* as against 67–74 (70.5) in nominate *spodocephala*, and the bill length averages about 14.5–15 in *sordida* and *personata* as against about 13 in nominate *spodocephala*.

The populations of the third group follow a continuous distribution from western Siberia eastward to Ussuriland, Manchuria, and northern Korea. Their geographical variation is clinal, the populations becoming increasingly tinged with greenish on the crown, nape, and throat and more yellowish on the under parts as they range farther east. Three races have been separated along this cline: *oligoxantha* Meise, 1932, type locality, Kuznetsk region, in the west; nominate *spodocephala* in the intervening region; and *extremi-orientis* Shulpin, 1928, type locality, Ussuriland, in the east. However, even at the opposite ends of the cline the populations are not nearly so well differentiated from one another as are *sordida* or *personata*. They are connected to nominate *spodocephala* by all sorts of populations which are intermediate to a varying degree, some of which are far from constant according to Stegmann (1931, Jour. Ornith., vol. 79, pp. 163–164). It may be added that it is impossible to identify the three forms with any degree of certainty among specimens collected while on migration or on the winter grounds. It seems to me that a much better understanding of the geographical variation of the species can be reached if only three clear-cut races with well-defined breeding ranges are recognized. To recognize *oligoxantha* and *extremi-orientis* serves only to confuse the pattern of this variation, and I consider these synonymous with nominate *spodocephala*.

The "Birds of the Soviet Union" (1954, vol. 5, p. 428) has synonymized *extremi-orientis* with *melanops* [i.e., *sordida*], but this is not correct. This form comes closest to *sordida* in coloration, as it is the most greenish and yellow of the populations described along the cline, but it has a small bill, a small and indistinct black facial mask, and is far from being so saturated with green and yellow. Furthermore, as stated above, it is widely separated from the breeding range of *sordida*.

Emberiza hortulana

No subspecies of the Ortolan Bunting are recognized except by Johansen (1944, Jour. Ornith., vol. 92, pp. 75–76) who has split this species

into four subspecies. The four are as follows: Nominate *hortulana* Linnaeus, 1758, type locality, Sweden, Johansen says is larger, darker, and more heavily streaked than the populations from the southern part of the range from southern Europe to the Iranian region. He divides the southern populations into two races, for which he revives the old names *anti-quorum* C. L. Brehm, 1831, type locality, Italy, and *shah* Bonaparte, 1850, type locality, Iran. The fourth race he describes as new as *elisa-bethae*, type locality, northwestern Mongolia, stating that this population is the largest and palest.

I cannot follow Johansen, and I consider the species to be monotypic. The specimens I have examined were collected in all the regions from whence he recognizes separate subspecies. While it is correct that those from southern Europe, Iran, and Mongolia show a tendency to be paler than those of northwestern Europe, it is an average difference only and an extremely trivial one at that. The range of individual variation is the same throughout the range of the species, and the great majority of the specimens are identical. No separation seems possible on the basis of size, as the measurements overlap too much. According to Johansen, the wing length in males from Mongolia measures 90–95 as against 86–91 in males from northwestern Europe, but his males from Siberia measure 88–94, no averages given. In male specimens that I have measured the range of variation in five from Sweden is 86–92, in seven breeding males from Italy 87–94, and in six breeding males from Iran 86–96. It does not seem to me that the variation in the wing length follows any clear-cut geographical pattern.

All the authors I have consulted include Afghanistan within the breeding range, but this is open to question. Large collections are available to me from this country but contain no specimens of *hortulana*. The only record for Afghanistan that I am aware of is that of a series of seven males collected on April 19–25 in the northwest, reported by Whistler (1945, Jour. Bombay Nat. Hist. Soc., vol. 45, p. 121), a date at which these specimens were probably on migration.

Emberiza buchanani

The Russian authors recognize two subspecies of the Gray-necked Bunting: *obscura* Zarudny and Korejev, 1903, type locality, Semirechia, for the populations of the northern and eastern parts of the range; and nominate *buchanani* Blyth, 1844, type locality, "Indian peninsula" for those from the southern and western parts of the range. The English authors and Hellmayr (1929, Field Mus. Nat. Hist., zool. ser., vol. 17, pp. 61–62) do not recognize any.

The material that I have examined suggests that three, not two, slightly different races are recognizable. One (*obscura*), which is grayer above and tends to be more heavily streaked on the mantle, occurs in Siberia, Mongolia, and Turkestan; another in eastern Afghanistan (Badakhshan and the Safed Koh) which is more rufous above, with a rusty or pale chestnut tinge on the feathers of the mantle, and darker bay and cinnamon below; and a third in Transcaspia and Iran which is rather pale and sandy, less grayish than *obscura*, less rufous above and paler below than the race of eastern Afghanistan. These comparisons were made only with specimens in worn breeding plumage collected from May to July, but the three types (the grayer, the more rufous, and the more sandy) can be recognized also among winter visitors in fresh plumage from India, although the majority cannot be identified with certainty.

The characters that separate the three races are not perfectly constant, but if subspecies are to be recognized in this species it seems to me that three must be accepted. The name *cerrutii* de Filippi (1863, Arch. per la Zool., vol. 2, p. 383), type locality, "Sardarak, Armenia and Sainkalé, Persia" (= Sain Qal'eh, Azerbaijan), is available for the western race, the range of nominate *buchanani* (of which *huttoni* Blyth, 1849, type locality, Afghanistan, is a synonym) becoming restricted to Afghanistan.

An isolated colony of this species breeds in the Mugodzhary Mountains, between the Urals and the Aral Sea. Specimens have not been examined by me, but on geographical grounds it seems better referred to *cerrutii*.

Emberiza cia

The Rock Bunting has been divided into many subspecies. These belong to two groups: the nominate *cia* group in which the stripes on the crown and ear coverts are black; and the *godlewskii* group in which they are chestnut. The two groups vary geographically.

NOMINATE *cia* GROUP

The populations of Europe and north Africa have been divided into three subspecies: nominate *cia* Linnaeus, 1766, type locality, lower Austria; *africana* Le Roi, 1911, type locality, Laimbèse, Algeria; and *callensis* Ticehurst and Whistler (1938, Ibis, p. 727, type locality, northern Portugal), but *africana* is not valid, and I question the validity of *callensis*.

Ticehurst and Whistler separated *callensis* from nominate *cia* as being "darker, especially on the rufous of the rump, upper tail-coverts, and upper parts," but in an earlier paper (1933, Ibis, p. 101) where they

discussed specimens from Portugal and Spain, they made no mention of color differences between these specimens or nominate *cia*. I have no specimens from Portugal, and it is possible that this population differs from that of Spain, but in view of the fact that the population from Spain is not separable from nominate *cia* it seems to me that *callensis* requires confirmation before a subspecies is accepted for Portugal alone.

The specimens that I have examined from Spain are nine, including some from the west. These are identical with nominate *cia* on the rump and upper tail coverts but, as a series, have a somewhat darker mantle with streaks that are very slightly blacker. The difference is far from constant, however, and is so very slight at best that it is certainly not of taxonomic importance. Von Jordans and Steinbacher (1942, Ann. Naturhist. Mus. Wien, vol. 52, pp. 212-213) state that their specimens from Spain and Portugal are identical above with nominate *cia*, but because they state they are brighter below, apparently separate them from nominate *cia* under the name *hordei* C. L. Brehm, 1831, type locality, southeastern Europe. All the specimens examined by me from Spain and various regions of Europe including the southeast are not separable below in any way, and *hordei* is a pure synonym of nominate *cia*. It is difficult to know on just what material *hordei* was based, because the Brehm Collection in the Rothschild Collection of the American Museum of Natural History does not now include any specimens at all from southeastern Europe.

Ticehurst and Whistler mentioned also that *callensis* was smaller than nominate *cia* but added that the difference is slight and not sufficient for separation, stating that the wing length in their males from Portugal was usually under 80 mm., though it measured up to 82 mm. I find that in five males from Austria the wing length measures 79-86 (82) and in seven from Spain 80-86 (82.5).

In the same paper, Ticehurst and Whistler remarked that their specimens from Algeria are not separable from nominate *cia* and that they do not recognize *africana*. Meinertzhagen (1940, Ibis, p. 135) made the same observation after examining specimens from Morocco. A good series examined by me from north Africa, including topotypes of *africana*, confirms the findings of these authors.

A cline of decreasing saturation runs from west to east, from Europe and Asia Minor eastward to Russian Turkestan, but is reversed from northeastern Afghanistan eastward to the western Himalayas. A number of forms have been described along this cline, but it seems to me that the geographical variation is adequately expressed by the nomenclatural recognition of only three, possibly four, subspecies. The three are nomi-

nate *cia* in Europe, north Africa, and Asia Minor and the Near East; *par* Hartert, 1904, type locality, Gaudan, southern Transcaspia on the border of Khorasan in northeastern Iran; and *stracheyi* Moore, 1855, type locality, Kumaon. These three subspecies are clearly differentiated: nominate *cia* is dark but not so dark above and below nor so richly colored as *stracheyi* and differs from it also in having the median and greater upper wing coverts tipped with rufous or chestnut instead of whitish, while *par* differs from both by being distinctly paler throughout.

The fourth race, which is usually recognized, is *prageri* Laubmann, 1915, type locality, Kuban district, northern Caucasus, but in my opinion it is not well differentiated from *par*, being only slightly darker. A form has been described from the Crimea as *mokrzeckii* by Molchanov in 1916 on characters intermediate between nominate *cia* and *par* but has been synonymized with *prageri* by the "Birds of the Soviet Union" (1954, vol. 5, p. 450). The lone specimen available to me from the Crimea is identical with a series of six from the northern Caucasus.

Two other forms have been described: *lasdini* Zarudny, 1917, type locality, Roshan and Shighnan in the Pamirs, and *serebrowskii* Hans Johansen (1944, Jour. Ornith., vol. 92, p. 78, type locality, southern Altai and Tarbagatai), but I consider them synonyms of *par*. According to Johansen, *serebrowskii* represents the eastern extreme in the cline of decreasing saturation. No specimens from southern Russia Altai and the Tarbagatai are available, but I question if these populations are sufficiently paler to warrant their separation from *par*. Specimens examined by me from Russian Turkestan from the Tian Shan north to Semirechia are not separable from those of southern Transcaspia and Khorasan, while Sushkin (1925, Proc. Boston Soc. Nat. Hist., vol. 38, no. 1, p. 23) states that the populations of the Tian Shan, Tarbagatai, and southern Russian Altai are the same and belong to *par*.

The form described by Zarudny as *lasdini* has been synonymized with *par* by the "Birds of the Soviet Union" (*tom. cit.*, p. 446), but while I believe it is correct not to recognize *lasdini* it is nevertheless true that specimens I have examined from northeastern Afghanistan, and from Badakhshan and Wakhan (and therefore just across the Amu River from Roshan and Shighnan) are no longer typical *par*. They are darker and about intermediate between *par* and *stracheyi*. The cline is strongly indicated in the northwestern Himalayas, much more so than at the western end of the range of *par*, but it is a reverse cline from the pale *par* to the dark *stracheyi*. The specimens that I have examined from extreme northwestern Kashmir, Baltistan, Ladak, Zaskar, and even Lahul and Kulu are progressively darker as these regions follow one another from west

to east. Hellmayr (1929, Field Mus. Nat. Hist., zool. ser., vol. 17, pp. 62-63) has already mentioned that the populations of the extreme north-western Himalayas were intermediate between *par* from Turkestan and Transcaspia and *stracheyi* from the Simla Hills. He refers those of Ladak and Baltistan to *stracheyi*, stating that those from Kaghan Valley [Hazara], Gilgit, and Chitral, though still intermediate, are nearer *par*. He is correct, but in view of the clinal variation the nomenclatural division of these populations must be more or less arbitrary. I believe, after examining very long series from the regions in which *par* grades into *stracheyi*, that it will be less confusing if all the populations from Indian territories are referred to *stracheyi* while those from Russian and Afghan territories are referred to *par*. Included in the latter, of course, are the populations from Waziristan on the Indian side of the Safed Koh.

A similar, though less arbitrary, division must be made at the western end of the range of *par*, if *prageri* is maintained as a valid race. Stresemann (1928, Jour. Ornith., vol. 76, p. 357) states that his specimens from the southern Caspian districts of northern Iran are nearer to *prageri*, while Paludan [1940, in Jessen, Knud, and R. Spärck (eds.), Danish scientific investigations in Iran, Copenhagen, pt. 2, pp. 33-38] believed that his specimens from the region of Gurgan, at the south-eastern corner of the Caspian, are identical with *prageri*. This is not confirmed, however, by the specimens I have examined from the region of Gurgan. These are very much closer to the type and paratypes of *par* and other specimens from Khorasan. Farther west in Iran, specimens from the region of Tehran, Azerbaijan in the northwest, Kermanshah in the west, and Luristan and Bakhtiari in the southwest average slightly darker, but these are still nearer to typical *par* mentioned above than topotypes of *prageri* that I have examined. The cline of decreasing saturation continues eastward in the Zagros, because specimens from Fars are slightly paler than those of Luristan and Bakhtiari. The specimens from Fars and from Kirman still farther east are in fact identical with typical *par*.

As emphasized above I do not consider *prageri* to be well differentiated from *par*, but if *prageri* is accepted as valid I believe that it is best to restrict its range to Transcaucasia, the Caucasus, and the Crimea, and to refer all the populations of Iran to *par*.

The cline of decreasing saturation running from nominate *cia* to *par* is accompanied by a cline of increasing size, and again this cline reverses itself from *par* to *stracheyi*. Wing length of adult males measured by me: southern Europe 79-86 (82.5) in 10 specimens, northern Caucasus 85-90 (88) in five, Iran 85-92 (89) in 10 specimens, Turkestan 86-91

(88.5) in four, northeastern Afghanistan 84–88 (84+) in 10 worn specimens, northern Kashmir 84–88 (86) in five, northern Punjab 83–90 (85) in 10 specimens; total number of specimens examined, 258.

THE *godlewskii* GROUP

This group has been revised by Sushkin (1925, Proc. Boston Soc. Nat. Hist., vol. 38, no. 1, pp. 22–28) who recognized seven subspecies, four of which he proposed as new. He stated that he preferred to treat this group as a separate species, and this view has been followed by some authors. Space is taken here to discuss this question briefly. The reasons advanced by Sushkin are that the two groups differ in the color of the stripes on the head, in the degree of sexual dimorphism, and in the plumage sequence of males, and do not intergrade. The facts that they do not intergrade and differ in coloration are not necessarily conclusive, and in my opinion the two groups do not show a significant departure from each other in sexual dimorphism or plumage sequence. The dimorphism is slight in both and varies geographically within about the same limits, and this is true also of the plumage sequence. I cannot agree that first winter males in *godlewskii* assume a body plumage at the postjuvenile molt which is identical with that of the adult, while first winter males of *cia* do not. A clear-cut difference is not evident in the specimens I have examined. Specimens from both groups which seem to be first winter males appear to be about like adult females, and the latter, as stated, do not differ much from adult males.

I have searched for structural differences such as shape of the bill, proportions, or wing formula that would support the view that the two groups are separate species but failed to find them. The bill in both is not necessarily identical in size, but it is of the same shape. After comparing two montane populations from Asia which breed within the same altitudinal range (*stracheyi* of the nominate *cia* group in the western Himalayas and *yunnanensis* of the *godlewskii* group in the Likiang Range of northern Yunnan), I found that the proportions were identical; in both forms the length of the tail was exactly 90 per cent of that of the wing. The wing formula was identical also. In short, while Sushkin may be correct, it seems that, with lack of proof one way or the other, it is a matter of opinion whether we call them one or two species. I follow the standard works, such as "Die Vögel der paläarktischen Fauna" and the "Birds of the Soviet Union," in treating them as one species.

GEOGRAPHICAL VARIATION: The seven subspecies recognized by Sushkin are: *godlewskii* Taczanowski, 1874, type locality, Lake Baikal; *yunnanensis* Sharpe, 1902, type locality, northern Yunnan; *omissa* Roths-

child, 1921, type locality, Tsinling Shan, Shensi; and the four he described: *decolorata*, type locality, Russian Turkestan in winter; *khamensis*, type locality, southern Tsinghai; *nanshanica*, type locality, eastern Tsinghai; and *bangsi*, type locality, Shansi. Two other forms must also be considered: *styani* La Touche, 1923, type locality, northwestern Szechwan; and *gobica* Tugarinov, 1929, type locality, Mongolia.

Over 100 specimens of these forms are available to me, and all the forms are well represented with the exception of *gobica*. They consist of the combined collections of the American Museum of Natural History and the Museum of Comparative Zoölogy. The latter were kindly lent by Mr. Greenway, and the value of the combined series is enhanced, because it is a major part of the series used by Sushkin for his revision, and many specimens bear his determinations.

This material shows that five races, out of nine listed above, are recognizable: *godlewskii*, with *nanshanica* and *gobica* as synonyms; *decolorata*; *khamensis*; *yunnanensis*; and *omissa*, with *styani* and *bangsi* as synonyms. *Decolorata* is distinctly paler than all the others and requires no further discussion. It is the only race described by Sushkin that is well differentiated.

I do not believe that *nanshanica* is valid. It was recognized by Bangs and Peters (1928, Bull. Mus. Comp. Zoöl., vol. 68, p. 377) and also by Meise (1937, Jour. Ornith., vol. 85, p. 485), but those authors emphasized that its characters were very slight, and Meise found that they were not constant, for he adds that he cannot distinguish between some of his specimens of *nanshanica* and *godlewskii*. In a series of 13 specimens of *nanshanica* examined by me, virtually all are identical with a series of seven specimens of *godlewskii* in comparative plumage.

The only specimen available from the Gobi was collected at some unspecified date in October and may not be a local bird. It is, however, slightly paler than most of the 20 specimens mentioned and tends to confirm the characters of *gobica*, described by Tugarinov as still paler than *nanshanica*. Nevertheless, the difference is extremely slight and, in view of the observation made by Kozlova (1933, Ibis, p. 75) that *gobica* is distinguishable only in large series and then "with some difficulty," it seems best not to recognize it.

The populations that range from southern Tsinghai southward through Sikang are intermediate in coloration between *godlewskii* and *yunnanensis* and were described as *khamensis* by Sushkin. They apparently connect the pale *godlewskii* with the dark and reddish *yunnanensis*. It is unfortunate, however, that Sushkin chose a specimen from southern Tsinghai as the type, because this region is on the extreme northern

border of the range of the intermediate form, and the population from this region (judging by specimens collected by Schäfer in 1935 during the breeding season in the region of Jyekundo and which are virtual topotypes) is barely distinguishable from *godlewskii*. However, as one progresses southward through Sikang the populations become darker, as recognized by Schäfer (1939, Proc. Acad. Nat. Sci. Philadelphia, vol. 90, p. 257), as well as more heavily streaked on the mantle, and those from southern Sikang grade into *yunnanensis*, as hinted by Sushkin. Compared as a whole, the intermediate *khamensis* is closer to *yunnanensis* but duller, paler, and less reddish.

Birckhead (1937, Amer. Mus. Novitates, no. 966, pp. 15-16) has mentioned a series of nine specimens from eastern Sikang (Tatsienlu, now Kangting) and from Wenchwan in western Szechwan, stating that he was not able to identify it. These specimens do not belong to a distinct form but are *khamensis*. Birckhead was not able to identify them, as no specimens of *khamensis* were available to him. The discussion of *khamensis* by Schäfer (*loc. cit.*) is confusing, because he compares it only to *omissa*, making no mention of *yunnanensis*, but it is clear from the comparisons and statements of distribution that his *omissa* is in fact *yunnanensis*.

The forms described by La Touche as *styani* and by Sushkin as *bangsi* are not valid and are synonyms of *omissa*. Thanks to the courtesy of Mr. Greenway, who included them in the material he lent me, I have been able to examine the types of *styani* and *bangsi* and to compare them together with their paratypes to the type and paratypes of *omissa*. Some of these specimens vary very slightly in their coloration, but the same range of variation prevails in the three series and almost all the specimens are identical. They also vary slightly in measurements, but these overlap and the differences do not seem sufficient to warrant separation. The wing length of adult males in the three series are: *omissa*, 78.5, 82, 82+, 83; *styani*, 83, 84, 85, 85.5 (type); *bangsi*, 80, 83, 83 (type), 85, 87. The type of *omissa* is a female and measures 82. The race *omissa* differs from all the others by being more cinnamon in tinge; it is brighter than *khamensis* and less dark and reddish than *yunnanensis*.

Birckhead had also a small series of three males and one female from Wanhsien in eastern Szechwan that he did not identify racially. As he observed, these specimens are less reddish above than *yunnanensis*, perhaps a trifle darker gray on the throat and upper breast, and intermediate between this race and *omissa* on the rest of the under parts. On the whole, however, they are closer to *yunnanensis*, but while not typical it is better in my opinion to refer them to this race than to propose a new and

slightly differentiated intermediate one. Bircckhead believed that these birds from Wanh sien are much smaller than *yunnanensis*, but with a larger series of the latter available I find that the size difference is not nearly so well indicated as he thought. The wing length of the three males measures 78, 79, 81 and that of the female 75, and these measurements fall within the range of individual variation of 20 males of *yunnanensis* which have a wing length of 75–86 (81) and seven females with one of 73–82 (77.5).

Emberiza cioides

Meise, in a review of the Meadow Bunting (1938, Compt. Rend. IX Congr. Ornith. Internatl., Rouen, pp. 243–248) recognized six subspecies, but only three were accepted by the "Birds of the Soviet Union" (1954, vol. 5, pp. 452–457). They are: nominate *cioides* Brandt, 1843, in Siberia, Turkestan, Mongolia, and western China; *castaneiceps* Moore, 1855, from Amurland and Ussuriland south to eastern China; and *ciopsis* Bonaparte, 1850, in Japan. The additional ones recognized by Meise are *weigoldi* Jacobi, 1923, type locality, southern Manchuria; *tarbagataica* Sushkin, 1925, type locality, Zaisan region; and his own described in 1937 as *tangutorum* (Jour. Ornith., vol. 85, p. 486), from northeastern Tsinghai.

The material that I have examined shows that *weigoldi* is well differentiated and should be recognized. In comparative plumage it is brighter than nominate *cioides* above and less whitish below and becomes distinctly redder above in worn plumage. It is smaller, the wing length of 10 adult males that I have measured from Ussuriland being 77–82 (79) as against 83–87 (85) in four from the Altai and Krasnoyarsk. According to Stegmann (1931, Jour. Ornith., vol. 79, p. 160), the wing length of males from southern Ussuriland is 75–81 as against 80–87 in nominate *cioides*. *Weigoldi* replaces nominate *cioides* in Amurland and Ussuriland, ranging south to northernmost Korea according to Austin (1948, Bull. Mus. Comp. Zoöl., vol. 101, no. 1, pp. 264–265) and southern Manchuria, probably grading into *castaneiceps* in northern Hopeh.

Shaw (1936, Fan Mem. Inst. Biol., Zool. Sinica, vol. 15, p. 892), discussing this last population, states that *weigoldi* "seems to be an individual variation, and should not be considered as a valid form," but I believe that he may have been misled, either because the population of Hopeh is intermediate or because his series was a mixed one which included visitors of *weigoldi*, which winters in northern China. At any rate, as Stegmann, Austin, and Meise (all cited above) and my material show, two distinct forms must be recognized, the larger and brighter *weigoldi*

breeding in the north and the smaller and darker *castaneiceps* breeding from Hopeh (perhaps) or at least from northern Shantung (examined) southward.

The other two forms (*tarbagataica* and *tangutorum*) recognized by Meise have been synonymized with nominate *cioides* by the "Birds of the Soviet Union." It seems to me that *tarbagataica*, though not so well differentiated as *weigoldi*, is sufficiently distinct to warrant recognition. It is similar to nominate *cioides* but paler in fresh plumage and somewhat more heavily streaked on the mantle in worn plumage, and the differences are constant in the specimens examined. I follow the "Birds of the Soviet Union," however, in not recognizing *tangutorum*. Three paratypes that I have examined are only very vaguely differentiated, being very slightly duller than nominate *cioides* and somewhat less streaked than *tarbagataica*. The chief character of *tangutorum* stressed by Meise in its description and the review is that it differs from nominate *cioides* and *tarbagataica* by having a rounder wing tip, but in the paratypes examined the difference is not constant or extremely slight.

The "Hand-list of the Japanese birds" (1942, p. 21) continues to recognize *ijimae* Stejneger, 1893, type locality, Tsushima, although its validity has been denied twice by Hartert (1923, *Die Vögel der paläarktischen Fauna*, Nachtrag, p. 25; 1932, *op. cit.*, suppl. vol., p. 92). It is not mentioned by Austin and Kuroda (1953, *Bull. Mus. Comp. Zool.*, vol. 109, no. 4, p. 598) in their work on the birds of Japan. No specimens from Tsushima are available to me, but I agree fully with Hartert that the alleged character of *ijimae*, browner on the ear coverts than *ciopsis*, is not necessarily diagnostic. I have examined 56 specimens from the main islands of Japan and from Tanegashima and Yakushima in various plumages, and these show that the color of the ear coverts varies individually. The "Hand-list" refers the populations of Iki, Quelpart, and Tsushima Islands to *ijimae*. As *ciopsis* is replaced in southern Korea by *castaneiceps*, in which the ear coverts in males are chestnut and do not become black or blackish as they do with wear in *ciopsis*, it is possible that in the islands between Japan and Korea the populations show intermediate characters. However, until the validity of *ijimae* is confirmed it is probably best not to recognize it.

Emberiza fucata

The Gray-hooded Bunting breeds in eastern Transbaikalia, Amurland, Ussuriland, Manchuria, Korea, and Japan, and also in eastern China and in the Himalayas eastward to northern Yunnan. It has been divided into four subspecies, only two of which are well differentiated: nominate

fucata Pallas, 1776, type locality, Transbaicalia; and *arcuata* Sharpe, 1888, type locality, Himalayas. The nominate race is paler and slightly larger than *arcuata*, its wing length measuring 72–77 (74.5) in 10 adults from southern Ussuriland as against 67–73 (70) in seven of *arcuata*.

The populations of eastern China, though intermediate between nominate *fucata* and *arcuata* in coloration and size, are closer to the latter. It is possible to recognize a separate though not well-differentiated subspecies for eastern China, but not two, and I therefore consider *fluvialis* La Touche, 1925, type locality, Chinkiang, a synonym of *kuatunensis* La Touche, type locality, northwestern Fukien, described on the same page as *fluvialis* with line priority.

The descriptions of the two Chinese forms show that "*fluvialis*" differs from *kuatunensis* only by being very slightly larger, wing of males "73–75" as against "69.5–71.5" in *kuatunensis*. La Touche added later (1927, A handbook of the birds of eastern China, London, Taylor and Francis, pp. 346–348) that they were not separable in coloration but repeated that *fluvialis* was larger, "wing about 73–75 mm." as against "68–71.5" in *kuatunensis*. The difference is so slight that it does not seem to be of taxonomic importance and, furthermore, is not confirmed by specimens I have measured from various regions of eastern China. These specimens show about the same range of variation along the Yangtze (to which La Touche restricted *fluvialis*) as they do in Fukien. Their wing lengths measure: Yangtze, 67, 69, 70, 71, 71, 73; northern Chekiang, 72, 74; Fukien, 70, 72, 73, 74, 74, 75; southern Yunnan, 68.

The specimen from southern Yunnan was collected at Mengtze on June 30 and is in worn breeding plumage, which suggests that the breeding range of the species extends farther south than Fukien, the southernmost breeding region mentioned by La Touche. I have examined also two adult specimens collected on May 21 and July 2 in northern Shantung at Chefoo and "Chimeh" which, at these dates and because they are in worn plumage, were probably local birds. They appear to be males and measure 69 and 76, and are identical in coloration with nominate *fucata*, although this is difficult to verify in view of their worn plumage. These specimens are of interest because there are apparently no breeding records for the species north of the Yangtze Valley where it is believed to occur only on migration. Our knowledge of the avifauna of northern China is not very adequate, however, and it is possible that the range may eventually be found to be more or less continuous from Manchuria through eastern China, and the geographical variation clinal in character.

Hartert and Steinbacher (1932, Die Vögel der paläarktischen Fauna, suppl. vol., p. 94) have accepted a separate subspecies for Japan (*laub-*

manni Stachanow, 1929), but the specimens I have examined from Japan are not separable from nominate *fucata*. This confirms the opinion of the following publications and authors which have all rejected the validity of *laubmanni*: the "Hand-list of the Japanese Birds" (1942, p. 21), Austin and Kuroda (1953, Bull. Mus. Comp. Zoöl., vol. 109, no. 4, p. 599), and the "Birds of the Soviet Union" (1954, vol. 5, p. 459).

Emberiza rustica

The Rustic Bunting was divided into two subspecies by Portenko (1930, Auk, pp. 205-207): nominate *rustica* Pallas, 1776, type locality, Transbaicalia, and a new race which he called *latifascia*, type locality, Kamchatka. The new race is said to have a purer black crown, a longer bill, and a broader band of chestnut on the breast, but recently its validity has been questioned by Austin and Kuroda (1953, Bull. Mus. Comp. Zoöl., vol. 109, no. 4, p. 600) who believe it is probably not valid and do not recognize it, and it is also rejected by the "Birds of the Soviet Union" (1954, vol. 5, p. 463). I follow the opinion of these authors.

My material from the western part of the range of the species, to which Portenko restricted nominate *rustica*, consists of only one specimen, but I may remark that a series of birds from the east do not confirm the bill measurements of *latifascia* given by Portenko. He stated that, in the latter, the bill length measured from the anterior border of the nostril was 8.1-9.2 mm. as against 7.7-8.4 in nominate *rustica*. The measurements were not separated as to sex. In 10 adults of both sexes that I have measured from Kamchatka, Gizhiga, Anadyrland, and Bering Island the bill measures 7.5-8.5. The width of the breast band is not a reliable character, as it varies a great deal individually.

Emberiza striolata

The House Bunting ranges from the Sahara eastward through the Sudan, Abyssinia, and Arabia to southeastern Iran, Baluchistan, and northwestern India. It has been divided into several races, the two valid races in the Palearctic region being: *sahari* Levaillant, 1850, type locality, Algeria, with *theresae* Meinertzhagen (1939, Bull. Brit. Ornith. Club, vol. 59, p. 68, type locality, Andja, southern Morocco) as a synonym; and nominate *striolata* Lichtenstein, 1823, type locality, Ambukol, Berber District, Sudan. The two are very distinct, *sahari* being much darker and rufous above and below and virtually unstreaked, while nominate *striolata* is less rufous, more grayish and sandy, and conspicuously streaked on the mantle.

The House Bunting is characteristic of the oases of the Sahara, but

in Morocco its range extends north of the desert to the region southwest of Mazagan and the regions of Mogador and Marrakech. According to Meinertzhagen (1940, Ibis, pp. 134-135) the populations of Morocco can be divided into two subspecies, *sahari*, and *theresae* that he had separated in 1939 from *sahari* as being "much deeper chestnut below and darker above." He states that the specimens that he had collected at Taddert south of Marrakech and at Ksar es Souk belong to *sahari*, while those from the Sous Valley southward belong to *theresae*. Meinertzhagen was not the first, however, to collect specimens south of the Sous Valley, and specimens from this region were found by Lynes (1925, Mém. Soc. Sci. Nat. Maroc, no. 12, pp. 38-39) to "quite agree with examples from Algeria and Tunisia."

Faced by this difference of opinion, I have compared specimens from Morocco with specimens from the Algerian and Tunisian Sahara, and the Aïr Massif in the southern Sahara. I find that no two series are identical in comparative plumage. Specimens examined from Tiznit, south of the Sous, are in fact very slightly paler, not darker, than specimens from Mogador, Marrakech, and the region southwest of Mazagan. Taken as a series, all those from Morocco average slightly darker above and slightly deeper chestnut below than series from El Kantara and Biskra in Algeria. However, the variation is such that in the last two series (collected by the same collector about 80 kilometers apart during the same week) the series from El Kantara is slightly darker and varies from that of Biskra to the same degree that it varies from that of Morocco. Three specimens collected at Gafsa in Tunisia are identical or virtually so with specimens collected in the same month in southern Morocco. In short, the geographical variation is much too irregular, as well as too slight, to warrant the separation of any one population, and I therefore consider *theresae* to be a synonym of *sahari*.

The series from the Aïr is the most interesting. These specimens are virtually as dark above and below as specimens in identical plumage from Morocco, but differ from them as well as from all the others mentioned by being more distinctly streaked above. They are still much closer to *sahari* but show a tendency towards the characters of *jebelmarrae* Lynes, 1920, type locality, Jebel Marra, Darfur. Lynes (1924, Ibis, p. 681) and Niethammer (1955, Bonner Zool. Beitr., vol. 6, p. 74) mention other populations that are intermediate in the Ennedi Massif and in northern Darfur.

The validity of *jebelmarrae* is not accepted by some authors. For instance, Meinertzhagen (1954, Birds of Arabia, London, Oliver and Boyd, p. 117) states that it is a synonym of *saturation* Sharpe, 1801.

However, the paratypes and topotypes of *jebelmarrae* that I have examined show that it is a well-differentiated race. They are larger and more richly colored, as stated by Lynes, than *saturation*, the type locality of which is Abyssinia. Five adults of *jebelmarrae*, four males and one female, measured by me have a wing length of 79–85 (81.6) as against 74, 77 in two adult males of *saturation*. Friedmann (1937, Bull. U. S. Natl. Mus., no. 153, pp. 478–479) states that his series of adult *saturation* measures 71–74.5. The latter and *jebelmarrae* differ from *sahari* and nominate *striolata* by being much darker and even more heavily streaked than nominate *striolata*.

Koelz (1954, Contributions from the Institute for Regional Exploration, Ann Arbor, no. 1, p. 20) has recently separated as *tesicola*, type locality, southeastern Iran, the populations of Iran and India from nominate *striolata*. The new form is described as "somewhat paler, less red, on abdomen, back, and wings; the striping on the average less conspicuous." However, the skins of comparative age that I have examined and that are the same material used by Koelz show that the differences are not constant and are much too slight, at best, for recognition of the validity of *tesicola*. This comparative material consists of old skins, and Koelz mentions that he has fresher ones from Iran and India, implying that these would differ from specimens from the Sudan along the lines he mentioned. This cannot be verified until fresh skins from the Sudan, not available to Koelz or to me, are compared. Skins of this species become "foxed" with age, as shown by some collected in Sind in 1934 and 1871.

Other workers have failed to find differences between the birds of the Sudan and Asia. For instance, Ticehurst (1922, Ibis, p. 658) states, after comparing specimens from Sind and the Sudan, that they are not separable.

Calcarius lapponicus

A distinct race (*subcalcarata* C. L. Brehm, 1826, type locality, Greenland) is recognized for Greenland by some authors, but its validity is denied by others. I agree with the latter that *subcalcarata* is not sufficiently well differentiated from nominate *lapponicus* Linnaeus, 1758, type locality, Lapland, to warrant its recognition. The Greenland bird is said to have narrower and paler edges on the feathers of the upper parts in the adult and immature plumage and a bigger bill. Salomonsen (1950, The birds of Greenland, Copenhagen, Munksgaard, p. 524) states that the color differences are slight but believes that the difference in the

length of the bill is sufficient for the validity of *subcalcarata* to be recognized.

The specimens compared by me from Greenland and Lapland are not separable. Most adults are identical, and only two out of six immature birds from Greenland are very slightly paler than immature specimens from Lapland. It is correct that the birds of Greenland show a distinct tendency to have a longer bill, but there again the difference is not constant, and individual measurements show a great deal of overlap. In fact, the overlap is virtually complete in the specimens I have measured, 17 males from Greenland measuring 13–15 (14.1) as against 12.5–15 (13.7) in 23 from Lapland. In the series measured by Salomonsen the bill of his 57 males from Greenland was 13.4–15.4 (14.54) as against 12.1–14.2 (13.13) in 36 from Scandinavia.

In addition to nominate *lapponicus*, two other races are recognized. They are valid, but the geographical variation of this species is not well marked, and their characters are rather weak. These two are *coloratus* Ridgway, 1898, type locality, Commander Islands, which is somewhat darker and more richly colored and breeds in the Commanders and Kamchatka; and *alascensis* Ridgway, 1898, type locality, St. Paul Island, which is somewhat paler than nominate *lapponicus* and breeds in the Aleutians, and in Alaska and adjacent Canada east to northwestern Mackenzie.

Plectrophenax nivalis

The Snow Bunting is one of Salomonsen's favorite species. He has discussed it in several papers, and in his first review (1931, *Ibis*, pp. 57–70) recognized five subspecies: *subnivalis* C. L. Brehm, 1826, type locality, Greenland; *insulae* proposed as new, with type locality, Iceland; nominate *nivalis* Linnaeus, 1758, type locality, Lapland; *townsendi* Ridgway, 1887, type locality, Pribilof Islands; and *hyperboreus* Ridgway, 1884, type locality, St. Michael, Alaska. In subsequent publications (1947, *Dansk Ornith. For. Tidsskr.*, vol. 41, pp. 136–140; 1950, *The birds of Greenland*, Copenhagen, Munksgaard, pp. 534–550) he described an additional subspecies and summarized his findings. The subspecies was described as *pallidior* in 1947, with type locality eastern Amurland. In the 1950 paper he stated that he had come to the conclusion that *subnivalis* was not sufficiently well differentiated from nominate *nivalis* to warrant its recognition. My specimens from Greenland support this conclusion.

Examination of good series from Siberia in all plumages shows that *pallidior* is well differentiated. It differs from nominate *nivalis* from Lap-

land, as illustrated by Salomonsen (1947, fig. 2), by being distinctly paler above in fresh plumage and in both sexes, while in worn plumage the white area on the rump is more extensive in the males, reaching onto the back. The Russian ornithologists do not distinguish between the populations of Lapland, Russia, and Siberia, calling them all nominate *nivalis*, but it is evident that those of Siberia (and, according to Salomonsen, those of northeastern Russia which I did not examine) are a distinct race.

An older name than *pallidior* seems, however, to be available for the Siberian populations. It was proposed by Portenko in a publication (1937, Vsesouiznyi Arkt. Inst., Problemy Arkt., no. 3, p. 124) not available to Salomonsen in 1947, and in which Portenko described the population of Wrangel Island as *vasowae*. The diagnosis does not mention that these birds are paler than nominate *nivalis*, stating in fact that they are identical with it in coloration but larger. Portenko probably followed the same concept of nominate *nivalis* as the other Russian authors and did not think it necessary to compare his specimens from Wrangel with topotypical nominate *nivalis*. At any rate, no specimens from Lapland were mentioned, and, though this is not certain, his specimens from Wrangel may be similar in coloration to *pallidior*. In view of this possibility, and until specimens from Wrangel are examined again in the light of Salomonsen's findings, it seems best to assume that only one form breeds in northeastern Siberia and to call it by the older name, *vasowae*.

The birds of Wrangel apparently are similar in size to those of Siberia. According to Portenko, his four specimens from Wrangel have a wing length of 111.8, 113.1, 113.3, and 116.8, no sex mentioned, while 27 males measured by me from Siberia have one of 109–116 (112.4) and 21 measured by Salomonsen (1947) one of 106–118. It does not seem possible, therefore, to separate the populations of Siberia from nominate *nivalis* on the basis of size, as their measurements and those of the population of Lapland show too much overlap, the wing length of the latter ranging from 104 to 114 in 23 males measured by Salomonsen in 1931.

Plectrophenax n. townsendi differs from the nominate race only through larger size, and there is some difference of opinion about its breeding range (usually stated as the Pribilofs, Aleutians, and Commanders), inasmuch as these populations differ somewhat in measurements. For instance, Hartert (1920, Novitates Zool., vol. 27, p. 155) said that while the birds from the Commanders were large, those from the Pribilofs and Aleutians were small, three males measuring 105, 111, 116. He added, "Possibly the Commander Islands birds will have to be

separated again from the Pribilof and Aleutian ones." However, these measurements are insufficient, and it seems best to call all the populations *townsendi*, at least as far east as Adak Island. No specimens were measured by me from farther east, and it is possible that the birds become smaller as one approaches the mainland of Alaska and that the latter would be best referred to nominate *nivalis*. The wing length of adult males I have measured is: Commanders, 115, 117, 118, 118, 119, 119, 119, 120; Pribilofs, 115, 119, 119, 119.5; western Aleutians (Attu and Adak), 113, 114, 115, 115, 119.5.