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Systematic Notes on Palearctic Birds. No. 27 Paridae: the Genera *Parus* and *Sylviparus*

By Charles Vaurie

With Supplementary Notes

By David Snow[1]

INTRODUCTION AND ACKNOWLEDGMENTS

The following notes were made during a study of *Parus* and *Sylviparus* in preparation of a contemplated check list of the Palearctic region. Notes are presented by me on 12 species. Among these reviewed in greater detail, or discussed at greater length, are: *Parus palustris, montanus, ater, varius,* and *major.* In *montanus,* the relationships of the *songarus* group are discussed, and it is believed by me that this group may represent a separate species, though, as the evidence is not conclusive, it is best to continue to consider it conspecific with *montanus.* I believe, on the other hand, that *bokharensis* has probably reached species level and should be regarded as specifically distinct from *major.* Two other species *(caeruleus* and *cyanus)* are discussed in a separate paper in the present series.[2]

I would like to express my gratitude to Mr. J. C. Greenway, Jr., of the Museum of Comparative Zoölogy, and to Dr. H. Johansen of the Copenhagen Museum for the loan of specimens, as well as to Mme. Tatiana Gidaspova who has greatly helped me in translating several Russian texts.

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1 Oxford University, England.

2 Vaurie, 1957, Amer. Mus. Novitates, no. 1833.

Dr. David W. Snow is engaged in reviewing the Paridae for "Peters' check-list of the birds of the world" and has been studying the collections in the British Museum (Natural History) supplemented by loans from other European institutions. He has not only lent me some of his notes but has also read the manuscript and has given me the benefit of his comments, and I am deeply indebted for his cordial and generous cooperation.

At the end of my notes, Snow has added a section which supplements my observations.

Parus palustris

The various populations of the Marsh Tit belong to two very widely separated groups, one in Europe ranging to the Urals, Asia Minor, and the Caucasus, and the other in Asia ranging from Russian Altai eastward to Sakhalin and Hokkaido, and south through some parts of China to northern Yunnan and about longitude 94° E. or "southeastern Tibet," with an isolated colony in the Chin Hills of southern Burma. The Asiatic group consists of several subspecies that are well differentiated, but the geographical variation in the European group is slight, and too many forms have been separated on very trival differences in coloration which represent various stages on a cline of increasing saturation. This cline runs from north to southwest in western Europe, the populations becoming browner as they range from Scandinavia and the Baltic states through Germany to northwestern France, the latter and also those of England being the darkest and brownest. The cline is apparently reversed farther south in France, as the populations of the Pyrenees and of northwestern Spain are again identical with those of the Alps and southern Germany. In northern Italy, the population is dark again, but less so than in northwestern France and England, and is somewhat more rufous than all the other European populations. My material from southeastern Europe is inadequate but, if one may judge by a small series from Romania and Bosnia, the birds of the Balkans are apparently identical, or virtually so, with those of Scandinavia. In the Caucasus the population is distinctly grayer than that of Scandinavia, is purer white on the cheeks, and lacks completely any traces of buff on the flanks, abdomen, and under tail coverts.

It seems to me that the geographical variation of the European group can be adequately expressed nomenclaturally by the recognition of only four subspecies.

1. *Parus p. brandtii* Bogdanov, 1879, type locality, Transcaucasia,

with *kabardensis* Buturlin, 1929, type locality, region of Vladikavkaz, as a synonym. This pale gray race is restricted to the northern and central Caucasus and neighboring western Transcaucasia and is perhaps isolated from the other populations of the species. It is widely separated from the populations of nominate *palustris* in the Urals, and a gap may separate it also from the populations in western Asia Minor, but nothing is known about the status of this species in Asia Minor except that it has been reported from the northwest in April, May, and June and very probably breeds there.

The correct name of this race may not be *brandtii* but *kabardensis* instead, as the true status of *brandtii* is a mystery. *Brandtii* was based on a single and, apparently, aberrant specimen without black on the throat which was discussed by Hartert (1905, Die Vögel der paläarktischen Fauna, footnote, p. 369) who states that it is not a specimen of *Parus lugubris* and who believes it is one of the *"mattköpfigen Sumpfmeise"* [i.e., *P. montanus*]. The latter, however, does not occur anywhere near the Caucasus or Transcaucasia, and *montanus* and *palustris* are so very similar morphologically that they could be confused, particularly if the type of *brandtii* is an aberrant specimen and, in addition, according to Hartert, is in very bad condition. It seems to me that until the identity of the type is established the name *brandtii* can be used, but if the type is truly unidentifiable the correct name of the race of the Caucasus and Transcaucasia will become *kabardensis.*

Brandtii is easily distinguishable from nominate *palustris,* but it is virtually identical in coloration with the populations from Ussuriland at the eastern end of the range of *brevirostris* on the continent. The only difference seems to be in size, *brandtii* being smaller. The difference is not too well shown in the specimens I have measured, four adults from the Caucasus having a wing length of 62–68 (65) as against 65–71 (67.5) in 10 from Ussuriland, but it is better marked in the specimens measured by Buturlin. According to Molineux (1930, A catalogue of birds, p. 135) who quotes the description of *kabardensis,* six males and four females from the Caucasus measure, respectively, 62–66 (63.6) and 59–61 (60).

2. *Parus p. italicus* Tschusi and Hellmayr, 1900, type locality, Siena, Italy.

3. *Parus p. dresseri* Stejneger, 1886, type locality, Great Britain, with *darti* Jouard, 1929, type locality, Loire Inférieure, northwestern France, as a synonym. The only specimen of *darti* that I have examined is a topotype which is not separable from the birds of England. The literature suggests that *darti* and *dresseri* are not quite identical, but there

seems to be no question that the two are only very slightly differentiated from each other. According to Mayaud (1935, Alauda, p. 411) topotypical *darti* in fresh fall plumage is not quite so "warm" brown on the back as *dresseri,* but *darti* is connected to the latter by intermediate populations in other parts of Brittany, the coloration of which is extremely similar to the populations of England, *"extrêmement voisine"* as stated by Mayaud. *Darti* is said to be the smallest form, but its measurements and those of *dresseri* are virtually identical. Mayaud (*loc. cit.*) states that the wing length measures 60–65 in male *darti,* and in a series of measurements that he had given earlier (1933, Alauda, pp. 102–103) he gave the wing length of one male from Finistère and four from the Loire Inférieure as 62.2–64.5 (64), but in 10 males that I have measured from England the wing length is 62–66 (63.6). As 10 males that I have measured from Sweden have a wing length of 65–70 (67), *dresseri* (including *darti*) differs from nominate *palustris* not only by being darker but also by being somewhat smaller.

4. *Parus p. palustris* Linnaeus, 1758, type locality, Sweden, with the following synonyms: *communis* Conrad,[1] 1827, type locality, Switzerland; *stagnatilis* C. L. Brehm, 1855, type locality, Galicia; *longirostris* Kleinschmidt, 1897, type locality, central France; *korejewi* Zarudny and Härms, 1902, type locality, Russian Turkestan; *balticus* Reichenow, 1916, type locality, Baltic states; and *congrevei* Kinnear, 1928, type locality, Transylvania.

Korejewi was based on specimens collected in the winter in the Kara Tau, near Tashkent in Russian Turkestan, and therefore far from the normal range of the species. These specimens, according to Hartert and Steinbacher (1933, Die Vögel der paläarktischen Fauna, suppl. vol., p. 189), were later found by Sushkin to be identical with nominate *palustris* from Russia. Stuart Baker (1922, Fauna of British India, vol. 1, p. 82) states that the range of *korejewi* is "Turkestan, Afghanistan, Baluchistan. A rare straggler into extreme N. W. India," and he adds that he has examined a clutch of eggs collected in Turkestan. As all these statements are unsubstantiated by records, they are quite inexplicable, as remarked by Hartert and Steinbacher.

In the Asiatic group it seems sufficient to recognize only four subspecies also.

5. *Parus p. brevirostris* Taczanowski, 1872, type locality, Prebaicalia,

[1] The author of *communis* and of nominate *montanus* (*Parus montanus; q. v.*) is usually quoted as Baldenstein, but his true name seems to be Conrad, according to Corti (1947, Ornith. Beobach., vol. 44, p. 68).

with the following synonyms: *crassirostris* Taczanowski, 1885, type locality, Ussuriland; *jeholicus* Kleinschmidt, 1922, type locality, southern Manchuria; *ernsti* Yamashina (1933, Tori, vol. 8, p. 169), type locality, Sakhalin; *mizunoi* Yamashina (1939, Tori, vol. 10, p. 484), type locality, southern Manchuria; and *altaicus* Johansen (1952, Jour. Ornith., vol. 92, p. 182), type locality, southern Russian Altai.

Only one typical specimen of *brevirostris* has been examined by me, and this specimen, collected at Krasnoyarsk, is paler than a series of 16 specimens of *crassirostris* examined from southern Ussuriland and a series of five of *altaicus* from the Russian Altai, four of which were very kindly lent to me by Dr. Hans Johansen. The difference between the specimens from the Altai and the one from Krasnoyarsk is quite slight, but it is rather well marked between this specimen and the series from Ussuriland. If one may judge by this material, the recognition of *crassirostris* would seem to be warranted, but one specimen is insufficient, and I follow the opinion of Voinstvenski (1954, Birds of the Soviet Union, vol. 5, p. 760), to whom a large amount of material from Siberia was no doubt available and who states that it is best not to recognize *crassirostris*. Evidently the difference is not so apparent in series as my single specimen would seem to indicate. Voinstvenski does not mention *altaicus*. He was probably not aware that it had been described, or perhaps it was described too late for him to consider it; but, in view of the fact that *altaicus* is even less well differentiated than is *crassirostris*, it is best synonymized with *brevirostris* also.

According to Voinstvenski, a cline of increasing saturation runs eastward at the eastern end of the range from typical *brevirostris* in Siberia to *crassirostris* in Ussuriland, and I believe that the slightly darker *altaicus* at the western end of the range suggests that a similar cline, though less well indicated than the eastern cline, runs westward from typical *brevirostris* to the Altai. It is also of interest to note that at both extremes of the range (the Altai in the west and Sakhalin in the east) the populations may be identical or virtually so. This is suggested by one specimen from Sakhalin which is identical with the specimens from the Altai. If this specimen is typical of the population of Sakhalin, it is certainly best not to recognize any subspecies. A somewhat similar though not identical situation prevails in western Europe, the populations at one end of the range (Pyrenees and northwestern Spain) showing a strong tendency to approach the coloration of the populations at the opposite end of the range.

6. *Parus p. hensoni* Stejneger, 1892, type locality, Hokkaido. This race, which is restricted to the southern Kuriles and Hokkaido, is very

similar in coloration to the populations (*"crassirostris"*) of *brevirostris* in Ussuriland, but it is slightly paler above and below, and its tail is distinctly shorter, measuring 53–58 (55.5) in four adults, as against 57–65 (61) in 10 of *"crassirostris."*

7. *Parus p. hellmayri* Bianchi, 1902, type locality, Peking. This race, which ranges from northern Hopeh to the Yangtze, is distinctly browner above than the preceding, darker below, and shows a tendency towards a reduction in size of the black patch on the throat. It is a small race, the wing length of 10 adults measuring 57–63 (59) as against 65–71 (67.5) in *brevirostris* from Ussuriland.

8. *Parus p. hypermelas* Berezovski and Bianchi, 1891, type locality, border of southern Shensi and Kansu, with *dejeani* Oustalet, 1897, type locality, northern Yunnan, as a synonym. This race ranges from southern Kansu through Sikang to northern Yunnan and recurs again in the northern Chin Hills and Mt. Victoria. This race is still darker above and below than *hellmayri* and quite a different shade of brown above, being olive brown, not warm brown. It is also heavily tinged with olive gray on the flanks and abdomen, and the black area on the throat is very extensive. It is, in fact, quite distinct morphologically from all the known forms of *palustris,* and Stresemann believes it is a separate species (1940, Mitteil. Zool. Mus. Berlin, vol. 24, p. 179). *Hypermelas* is not well known, however, and until further study is probably best considered conspecific with *palustris,* as the two replace each other geographically and seem closely related.

The various populations now referred to *hypermelas* require further study, but, unfortunately, adequate comparative material is lacking. *Hypermelas,* which was based on only two specimens (see Deditius, 1897, Jour. Ornith., vol. 45, pp. 72–73), has not, apparently, been collected since it was discovered and does not seem ever to have been compared directly to *dejeani.* This does not necessarily imply, however, that the latter is valid, because Dr. Snow believes, after comparing *dejeani* to the color plate of *hypermelas* given by Berezovski and Bianchi, that the two are not separable. This plate is not available to me, and this information was kindly given by Dr. Snow. Specimens from the Chin Hills suggests, on the other hand, that this population may be a distinct form, because Stresemann (*loc. cit.*) states that his series from the Chin Hills differs from a single specimen from Batang in central Sikang by having the black of the crown more restricted posteriorly. This series is in worn plumage, and one of its specimens that I have examined does differ from two typical specimens of *dejeani* available to me from northern Yunnan through exactly the same dif-

ference noted by Stresemann. Nevertheless, it does not seem that any definite conclusion can be reached, as the comparative material examined by Stresemann or myself is very insufficient.

Parus montanus

The Willow Tit (*Parus montanus*) of the Old World is not conspecific with the Black-capped Chickadee (*P. atricapillus*) of the New World. The view that they are one species seems to have been first advanced by Hartert (1905, Die Vögel der paläarktischen Fauna, p. 376), and, because of his authority, this opinion has been followed by almost all authors. Hartert, however, did not know the American chickadees in life, and some students who did know them were never convinced that his opinion was correct. The views of the dissenters were well expressed by Bangs and Peters (1928, Bull. Mus. Comp. Zoöl., vol. 68, p. 360) who protest that to treat the two as conspecific "does not properly represent the facts. The American forms are quite unlike their Old World cousins in life, and have very different voices, and we unhesitatingly consider them specifically distinct." In recent years an increasing number of students have shared the view of Bangs and Peters, and this change of opinion culminated in two papers published recently, one by Mayr (1956, Beiträge zur Vogelkunde, Festschrift Heyder, vol. 5, pp. 112–117) and the other by Snow (1956, Bull. Brit. Ornith. Club, vol. 76, pp. 29–31).

The Old World forms show a high degree of geographical variation, but, with one important exception, this variation is very predominantly clinal in character. The exception consists of a group of four forms distributed in Asia from the Tian Shan to southern Manchuria—the so-called *songarus* group—which may represent a separate species. In the other forms (the nominate *montanus* group), even the insular populations of Great Britain and Japan, though distinct races, represent the ends of clines, but no intermediate forms connect the two groups, or, for that matter, any of the four members of the *songarus* group. As the latter are of much interest, their morphological characters are compared below:

Songarus: Large (wing length averages 69); cap dull black (with a faint suggestion of brownish, but distinctly black, not brown); back and flanks ocher (warm and bright on the back, duller on the flanks); bill very long (averages 13.8, and is at least 2 mm. longer than in any other form in either the *songarus* or nominate *montanus* group).

Affinis: Smaller (wing length averages 65.5); cap pure brown; back darker than in *songarus,* brown, not ocher, but flanks of the same color as in *songarus;* bill short (averages 11 mm.).

Weigoldicus: Similar in size to *affinis;* cap dull brownish black (less black than in *songarus,* but not pure brown as in *affinis*); back and flanks very dark and brown (distinctly darker than in *affinis*); bill short (averages 11 mm.).

Stötzneri: Small (wing length 60–66); cap pure brown as in *affinis;* much paler than the other three (the back is grayish brown and the flanks are buffy white); bill short (10.5 in the only specimen examined).

This comparison shows that the four forms differ abruptly, or relatively so, from one another, but, although I have stressed this dissimilarity, there is little doubt that they are all very closely related and conspecific. Their distribution is not well known, and it is possible that eventually intermediate populations may be discovered, although, as their dissimilarity suggests, it is more likely that they are more or less well isolated geographically from one another. Whether or not they are conspecific with the nominate *montanus* group is not certain, but in view of the fact that they are its nearest relatives and replace it geographically it is best, I believe, to consider that the two groups are conspecific. Song and calls have been shown to be good clues to relationship in the group of the Paridae to which these tits belong, but unfortunately we know nothing about the members of the *songarus* group in life.

There is some ground for believing that the two groups are conspecific. The fact that *stötzneri*[1] differs chiefly from the nominate *montanus* group only in the color of the cap is suggestive, because in the related *P. lugubris* we find a similar and intraspecific variation in the color of the cap. This was pointed out by Snow (*loc. cit.*) who remarks also that in the regions inhabited by the *songarus* group several "*Parus* species are represented by sometimes rather distinct but undoubtedly conspecific populations." Snow is quite correct, but nevertheless a word of warning is in order, because it is possible that some of these distinct "populations" may, in fact, be separate species.

For instance, Stresemann (*loc. cit.*) believes, as is shown above in the

[1] Of the four races of the *songarus* group, *stötzneri* approaches most closely in its distribution the range of the nominate *montanus* group, the latter ranging as far south as central Manchuria, and *stötzneri* north to southern Manchuria. In the west the two groups also approach rather closely, *baicalensis* of the nominate *montanus* group breeding south to the Tarbagatai, and *songarus* proper, north to the Dzungarian Ala Tau, but these two forms are most distinct and are isolated by a barrier of unsuitable territory. In Manchuria no such barrier would seem to separate the two groups, though apparently their ranges do not meet. The fact that *stötzneri* approaches rather closely in some respects the coloration of the nominate *montanus* group suggests that perhaps this gap is bridged occasionally and that the forms may then interbreed.

discussion of *P. palustris,* that *hypermelas* is not conspecific with *palustris,* although it is generally assumed to be. *Hypermelas* inhabits several of the regions inhabited by the *songarus* group, notably Kansu, eastern Tsinghai, Sikang, and northern Yunnan. In the present paper I discuss below my belief that *bokharensis,* which inhabits the Tian Shan, is not conspecific with *P. major,* although hitherto it has always been considered to be so. In Number 26 of the present series of papers[1] I have discussed the possibility that *flavipectus,* also from the Tian Shan, and perhaps also *berezowskii,* from the region south of the Koko Nor, now both considered to be subspecies of *P. cyanus,* may be separate species.

The nominate *montanus* varies a great deal geographically, but its variation is very predominantly clinal in character, and its study is relatively simple. Several clines can be discerned. One of decreasing saturation and increasing size runs from west to east, from Scandinavia across Siberia to Kamchatka. The cline in coloration is very well marked indeed, the populations of Scandinavia being grayish brown above and relatively dark, while those of Siberia are paler and grayer, to become almost white in Kamchatka. The populations become also progressively paler below from west to east, acquire paler edges on the wing and tail feathers, and the white area on the cheeks spreads or tends to spread farther back. The increase in size is slight, however, and has been exaggerated in the literature. For instance, when four stages on the cline are compared, the measurements are as follows: Scandinavia, 10 males, wing 62–66 (64), tail 52–57 (55); Orenburg, southeastern Russia, five males, wing 64–68 (66), tail 57–60 (58); central and eastern Siberia, five males, wing 66–69 (68), tail 58–60 (58.5); Kamchatka, 10 adults (two males, two females, and the rest not sexed), wing 62–67 (65), tail 55–60 (57.5). The measurements from Siberia and Kamchatka are perhaps not quite comparable, but they suggest that size decreases somewhat in Kamchatka. The population of Siberia (*baicalensis*) is also acknowledged in the literature to have the longest tail of any race, and its tail measurements are said occasionally to reach 65 mm. The races that can be recognized along this cline are: *borealis, uralensis, baicalensis, anadyrensis,* and *kamtschatkensis.*

In the coastal districts of southeastern Siberia, the populations require further study but probably reverse the cline to some extent, while in Japan the populations (*restrictus*) are very similar to those (*borealis*) at the western end of the cline in Scandinavia. They are virtually iden-

[1] 1957, Amer. Mus. Novitates, no. 1833.

tical to the latter in coloration and size, though they have a duller black crown, are very slightly darker on the back, and their tail seems to average very slightly shorter, 10 males from Japan measuring wing 62–67 (64.5), tail 50–55 (53). The population of Sakhalin (*sachalinensis*) is apparently an intermediate form which is discussed below.

In western Europe another cline runs southward, this one of increasing saturation and decreasing size, the populations becoming browner above, darker buff below, and less pure white on the cheeks. Along this cline the following can be recognized: *borealis, salicarius, rhenanus,* and *kleinschmidti.* In the foothills of the Alps this cline is reversed, and the populations become gray and large again, while in the mountains of southeastern Europe the populations are similar to those of the Alps but less grayish, more fulvous. Many populations are intermediate in characters throughout the range of the species, and in the Alps some local populations tend to differ very slightly. It would lead much too far to recognize nomenclaturally all the intermediates or very slightly differentiated local populations that have been described, and in addition to the forms listed it is sufficient, I believe, to recognize only nominate *montanus* in the Alps and foothills, and *transsylvanicus* in the mountains of southeastern Europe, making a total of 12 valid races for the nominate *montanus* group.

This group has been discussed a great deal in the literature, the great majority of the papers being concerned exclusively or chiefly with the European populations. Among these papers the one by Stresemann and Sachtleben (1920, Verhandl. Ornith. Gesell. Bayern, vol. 14, pp. 228–269) may be cited, as it presents a clear and well-balanced study of the variation in Europe. Jouard wrote a series of lengthy papers between 1925 and 1941, but, although these papers contain much valuable information, this information is presented in such a confused manner and he has recognized so many dubious "subspecies," particularly in the Alps, that the result of his studies has unfortunately served chiefly to obscure the pattern of variation. Jouard's more important papers are the one published in 1936 (Alauda, pp. 342–471), which contains an exhaustive bibliography of 114 titles, and the one published in 1941 (Arch. Suisses d'Ornith., vol. 1, pp. 511–534) after his death, which is a summary of his conclusions. In this last paper he recognized 21 subspecies in Europe (11 in the Alps and neighboring mountains alone!) where Stresemann and Sachtleben had recognized only seven, and I believe it is amply sufficient to recognize but six.

All the races that I believe are valid are listed below for the entire species with their synonyms, if any. Some synonyms are discussed briefly.

1. *Parus m. borealis* de Sélys-Longchamps, 1843, type locality, Norway, with the following synonyms: *assimilis* C. L. Brehm, 1855, type locality, eastern Carpathians; *colletti* Stejneger, 1889, type locality, western Norway; *tischleri* Kleinschmidt, 1917, type locality, East Prussia; and *lönnbergi* Zedlitz, 1925, type locality, Finland.

Tischleri represents a form intermediate between *borealis* and *salicarius* and was recognized by Stresemann and Sachtleben, though they emphasized its intermediate character. The material that I have examined from East Prussia is without a doubt much closer to *borealis* and so slightly differentiated from it that I believe *tischleri* is best synonymized. A series of eight specimens of *colletti* averages slightly more buffy on the flanks, and slightly more creamy, less pure white, on the posterior part of the cheeks than *borealis*. However, these differences are very slight at best and far from constant, particularly as regards the color of the cheeks, and I think, therefore, that it is best also not to recognize *colletti*. I agree, further, with Hartert and Steinbacher (1934, Die Vögel der paläarktischen Fauna, suppl. vol., p. 194) that true *assimilis* from the eastern Carpathians should be synonymized with *borealis*. The populations of Transylvania and the Balkans are usually called *assimilis*, but it is not until the Carpathians are crossed that we find populations sufficiently distinct from *borealis* to warrant nomenclatural separation. These, I believe, should be called *transsylvanicus*.

2. *Parus m. salicarius* C. L. Brehm, 1831, type locality, Thuringia, with *natorpi* Kleinschmidt, 1917, type locality, Silesia, as a synonym. *Natorpi* is another intermediate on the cline from *borealis* to *salicarius* but this time closer to the latter than is *tischleri*.

3. *Parus m. rhenanus* Kleinschmidt, 1900, type locality, Darmstadt, with *subrhenanus* Kleinschmidt and von Jordans, 1916, type locality, Bonn, as a synonym. The populations (*subrhenanus*) of the lower Rhine show a tendency to be very slightly darker and very slightly smaller (but only about 1 mm. on an average) than those of the middle and upper Rhine. They thus show a tendency towards *kleinschmidti* of Great Britain.

4. *Parus m. kleinschmidti* Hellmayr, 1900, type locality, Finchley near London.

5. *Parus m. montanus* Conrad, 1827, type locality, Graubündens [or Grisons], Switzerland, with the following synonyms: *alpestris* Bailly, 1852, type locality, Savoie; *submontanus* Kleinschmidt and Tschusi, 1913, type locality, Austria; *supermontanus* Kleinschmidt, 1921, type locality, Dolomites, northern Italy; *elenae* Lowe, 1921, type locality,

northwestern Italy; *alpinus* Ghidini and von Burg, 1924, type locality, Tessin and Grisons (see von Burg, 1925, *in* Jouard, Rev. française d'Ornith., vol. 9, pp. 72, 103); *festae* von Burg, 1925, type locality, Carnic Alps, northeastern Italy; *jouardi* von Burg, 1925, type locality, Valais, Switzerland; *arrigonii* von Burg, 1925, type locality, Cottian Alps, northwestern Italy; *styriacus* Kleinschmidt (1937, Berajah, p. 36), type locality, southern Austria; and *schiebeli* Kleinschmidt (1937, *ibid.*), type locality, Cerknica, Slovenia.

Submontanus is a poorly differentiated intermediate between *salicarius* and nominate *montanus*. All the other forms were correctly synonymized with nominate *montanus* by Hartert and Steinbacher (*op. cit.*) with the exception of *alpinus* which they overlooked, and, of course, those described in 1937. They are listed above because these, as well as *alpestris,* were revived by Jouard in 1941 (*loc. cit.*), with the exception of *alpinus* which is a pure synonym of nominate *montanus*. *Styriacus* is invalid (see Frank, 1941, *in* Jouard, Arch. Suisses d'Ornith., footnote 35, p. 530). *Schiebeli* was not examined by me, but if one may judge by its description it seems to have been based on specimens intermediate in coloration between nominate *montanus* and *transsylvanicus*. I consider that *schiebeli* is best synonymized with nominate *montanus,* because Kleinschmidt mentions that he subsequently examined material from "Warmberg near Ainödt" [or from the same region from which *schiebeli* was described] which he says is indistinguishable from *supermontanus*. This latter, as stated, I consider to be a synonym of nominate *montanus*.

6. *Parus m. transsylvanicus* Kleinschmidt, 1921, type locality, eastern Transylvania, with *rhodopeus* Harrison and Pateff (1937, Ibis, p. 604), type locality, Rhodope Mountains, as a synonym.

7. *Parus m. uralensis* Grote, 1924, type locality, Ufa, eastern Russia.

8. *Parus m. baicalensis* Swinhoe, 1871, type locality, Kultuk, southern Lake Baikal, with the following synonyms: *suschkini* Hachlow, 1912, type locality, Tarbagatai; and *shulpini* Portenko (1954, Fauna U.S.S.R., no. 54, Birds, vol. 3, p. 177), type locality, Suchan, southern Ussuriland.

Suschkini was not examined by me, and I follow the opinion of Voinstvenski (1954, Birds of the Soviet Union, vol. 5, p. 765) who has synonymized it with *baicalensis*. This author has also synonymized *anadyrensis* and *sachalinensis* with *baicalensis,* but *anadyrensis,* at any rate, seems to be fairly well differentiated. *Sachalinensis* does not appear to be very well differentiated but it may be valid also, or, if not, should perhaps be synonymized with *restrictus* instead. I did not ex-

amine specimens from Sakhalin, but Dementiev (1936, *in* Jouard, Arch. Suisses d'Ornith., p. 411) states that *sachalinensis* approaches the characters of *restrictus,* which is confirmed by Austin (1953, *in* Austin and Kuroda, Bull. Mus. Comp. Zoöl., vol. 109, p. 515). *Sachalinensis* was described as intermediate between *kamtschatkensis* and *restrictus* by Lönnberg, but Austin intimates it is not well differentiated, as he states it is a "fine split," but he nevertheless recognizes it, and, as I lack material, I follow his opinion.

I cannot, however, see any appreciable difference between specimens from lower Amurland, Ussuriland, and Korea and specimens of *baicalensis,* and I believe *shulpini* should not be recognized, at least until further study. These populations from the Far East, as well as those north of the lower Amur on the southern coast of the Sea of Okhotsk and the Shantar Islands, were separated as *shulpini* by Portenko. He states, in the Latin diagnosis, that *shulpini* is "very similar" to *sachalinensis* but has a shorter wing and is darker above and more rufous, but in the Russian text he does not mention *sachalinensis* and merely states that *shulpini* is more sandy above than *baicalensis,* and he nowhere gives any comparative measurements. It is probable that the populations from the extreme East are no longer typical *baicalensis,* though Stegmann (1931, Jour. Ornith., vol. 79, p. 218) had called them *baicalensis,* but they would seem to require further study before *shulpini* is recognized, and until then this name is best synonymized with *baicalensis.*

This procedure is strongly suggested by the five specimens that I have examined from the range of *shulpini,* as these are either identical with *baicalensis* or depart from it by being only slightly browner above, or rather "more sandy" as expressed by Portenko, but this difference is extremely slight and, as stated, is not constant. I also fail to see any appreciable difference in size between these five specimens and the five of *baicalensis,* the measurements of which are given above. Those from the Far East measure: males, wing 67, 68, 69, tail 58, 60, 61; one female, wing 63, tail 55; and one unsexed, wing 64, tail 58. The five from the East consist of one from Nikolaevsk and the other from Komsomolsk in lower Amurland, one from the upper Ussuri River and the other from Amur Bay near Vladivostok which is therefore a virtual topotype of *shulpini,* and the fifth is from Korea.

The status of this species in Korea is not clear. Austin (1948, Bull. Mus. Comp. Zoöl., vol. 101, p. 192) states that it is only a rare straggler in Korea and is known from only two specimens, one taken near Seoul in October and the other in the northeast, probably in January. How-

ever, as stated above, I have examined one from Korea, and it was collected on May 8, 1903, at Genzan, and presumably Portenko has examined others.

9. *Parus m. anadyrensis* Belopolski, 1932, type locality, Markovo on the Anadyr.

10. *Parus m. kamtschatkensis* Bonaparte, 1850, type locality, Kamchatka.

11. *Parus m. sachalinensis* Lönnberg, 1908, type locality, Sakhalin. This form, which may not be sufficiently differentiated from *restrictus* to warrant its recognition, is discussed above under *baicalensis.*

12. *Parus m. restrictus* Hellmayr, 1900, type locality, Hondo.

13. *Parus m. stötzneri* Kleinschmidt, 1921, type locality, Jehol, southern Manchuria.

14. *Parus m. affinis* Prezvalski, 1876, type locality, Ala Shan and Kansu.

15. *Parus m. weigoldicus* Kleinschmidt, 1921, type locality, extreme northwestern Yunnan.

16. *Parus m. songarus* Severtzov, 1872, type locality, Tian Shan.

Parus cinctus

The Siberian Tit ranges from northern Scandinavia eastward in the northern taiga to Anadyrland, Alaska, northern Yukon, and northwestern Mackenzie, with colonies in the mountains of southern Siberia and northwestern Mongolia which may be more or less isolated from the populations of northern Siberia. In the northern populations the geographical variation is clinal from west to east, the populations becoming paler above and below as they range farther east and showing less of a contrast between the color of the crown and that of the back, the crown being grayish brown and the back pale chestnut brown in the western populations. In addition, a similar cline of increasing paleness apparently prevails in central Siberia from south to north, as the populations from the northern limits of the range on the Taimyr Peninsula and the lower Lena are said to be quite as pale as those from the eastern end of the range.

It seems to be sufficient to recognize only two subspecies in northern Eurasia: *lapponicus* Lundahl, 1848, type locality, Lapland, in the west and ranging about as far east as the Pechora Basin; and nominate *cinctus* Boddaert, 1783, type locality, Siberia, east of *lapponicus.* One might be tempted to separate the palest populations as *kolymensis* Buturlin, 1908, type locality, northeastern Siberia, except that the dif-

ference between *kolymensis* and nominate *cinctus* are said to be quite slight and it is impossible to draw satisfactory boundaries between the two. In the mountains of the south, from the Altai, Minusinsk taiga, and the Sayans south to the Tannu Ola and Khangai in northwestern Outer Mongolia, the populations have a distinctly larger and thicker bill than either *lapponicus* or nominate *cinctus* and have been described as *sayanus* by Sushkin, 1904, type locality, western Sayan and Altai.

Voinstvenski (1954, Birds of the Soviet Union, vol. 5, pp. 767–771) has recognized only *lapponicus,* nominate *cinctus,* and *sayanus,* and this treatment seems correct. But he has also referred the American populations to nominate *cinctus,* synonymizing *alascensis* Prazák, 1895, type locality, St. Michael, Alaska (see Hellmayr, 1934, Catalogue of birds of the Americas, pt. 7, p. 77, footnote 3), with nominate *cinctus,* and this last treatment is not correct. *Alascensis* is slightly darker below and more grayish above than nominate *cinctus,* but these differences are very slight and by themselves would not be of taxonomic importance; but *alascensis* is perfectly valid and must be recognized, as it differs conspicuously from nominate *cinctus* by having a much smaller bill—only about half of that of *cinctus* in length and thickness.

The generally recognized range of the species includes only the regions mentioned, but some authors state that this species breeds also in Inner Mongolia and northern Hopeh. Swinhoe (1871, Proc. Zool. Soc. London, p. 362) states that *cinctus* breeds in the "woody mountains west of Pekin (David)." This statement is made apparently on the sole authority of Père David, who, together with Oustalet (1877, Oiseaux de la Chine, p. 289), states that he has found *cinctus* only in the mountains of the "Ourato" [= Inner Mongolia] where it breeds and seems to be resident. Shaw (1936, Fan Mem. Inst. Biol., Zool. Sinica, ser. B., vol. 15, pp. 637–638) states that *cinctus* is a permanent resident in the mountains of northern Hopeh and that the collection of the Fan Institute contains specimens collected in Hopeh. Latouche in his "Birds of eastern China" does not mention *cinctus,* and Hartert, or Hartert and Steinbacher, do not mention that it occurs in China or Inner Mongolia in "Die Vögel der paläarktischen Fauna." These regions are so very far out of the generally recognized range that it is possible that David was mistaken and that an error has crept into the work of Shaw. At any rate, the occurrence of *cinctus* anywhere in Asia, outside of Siberia and the forests of western Outer Mongolia, seems to require confirmation.

Parus cristatus

The Crested Tit varies geographically, but this variation is relatively slight, and it seems to me that it has been divided into too many subspecies. Hartert and Steinbacher (1933, Die Vögel der paläarktischen Fauna, suppl. vol., pp. 187–188) synonymized six of these, four of them described by Jouard, or Heim de Balsac and Jouard, with *mitratus* C. L. Brehm, 1831, type locality, southern Germany, and questioned the validity of another race (*abadiei*) described by Jouard in 1929 from Brittany.

I believe that five subspecies can be recognized, and the geographical variation seems to be as follows. In Scandinavia and northern Europe south to Poland, the populations are grayish brown above and the under parts are pale, creamy white on the breast and abdomen, and more or less extensively but rather weakly tinged with grayish or rufous buff on the flanks. These populations are typical of the nominate race. In Russia a cline of decreasing saturation runs eastward and southeastward, and at the eastern end of the range of the species, which is reached on the eastern slopes of the Urals, the populations are distinctly paler and grayer than nominate *cristatus* Linnaeus, 1758, type locality, Sweden, and have been described as *baschkirikus* by Snigirevski in 1931, with type locality, southern Urals. It is not clear to me whether the ranges of nominate *cristatus* and *baschkirikus* are continuous, but at any rate in eastern and southeastern Russia, and also in the southern Balkans, north to about Sarajevo in southern Yugoslavia, the populations are more or less intermediate in coloration between *baschkirikus* and nominate *cristatus,* though closer to the latter. These intermediates have been described as *somovi* by Fediuschin in 1927, type locality, gouvernement of Kharkov, Ukraine, and as *bureschi* by von Jordans (1940, Izv. Tzar. Prirod. Inst. Sofia, vol. 13, p. 90, type locality, Bulgaria). *Somovi* has been synonymized with nominate *cristatus* by Voinstvenski (1954, Birds of the Soviet Union, vol. 5, p. 752), and it seems best also to synonymize *bureschi* with it. Specimens from Bulgaria were not examined by me, but, if one may judge by the description of *bureschi* (which was not compared to *somovi* by von Jordans), this form would not appear to differ from *somovi.*

In western and central Europe, the variation follows a different cline in coloration, the gray of the upper parts becoming replaced by warm buffy brown and the under parts becoming darker, more deeply washed with darker rufous on the flanks. These populations are

mitratus C. L. Brehm, 1831, type locality, southern Germany, and populations of this type, which may vary very slightly in some regions such as the Alps, Pyrenees, and mountains of Spain, range at least as far south as central Spain.

In addition to nominate *cristatus, baschkirikus,* and *mitratus,* it is possible to recognize two other races: *scoticus* Prazák, 1897, type locality, Scotland (with *abadiei* as a synonym), and *weigoldi* Tratz, 1914, type locality, Portugal. These two races are smaller than the other three and are darker than *mitratus,* their wing length in males ranging from 61 to 65 as against 63 to 70 and 62 to 68 in long series of male *mitratus* and nominate *cristatus,* respectively. *Abadiei* was not examined by me, but I believe it is best synonymized with *scoticus.* The author of *abadiei* failed to compare it to *scoticus* (or to *weigoldi*) in its diagnosis, but this diagnosis leaves no doubt that *abadiei* does not differ appreciably from *scoticus.*[1]

Weigoldi is not well differentiated from *scoticus,* but in the few specimens I have compared those of *weigoldi* are not quite so dark above and below and the pale edges of the feathers of their crown and crest are whiter. *Weigoldi,* generally speaking, is also a costal form, but the regions it inhabits are less humid and receive considerably more sunlight than Scotland or Brittany, and its characters are influenced also by a certain amount of gene flow from the paler *mitratus,* as intermediate populations have been reported from Galicia and the region of Murcia. *Weigoldi* is most typical in Portugal and along the coastal districts of southern Spain north to about Malaga and the region of Granada.

Parus dichrous

The Brown Crested Tit varies geographically and can be divided into four subspecies, which, ranging from the Himalayas to China, are: *kangrae* Whistler, 1932, type locality, northern Punjab; nominate *dichrous* Hodgson, 1838, type locality, Nepal; *wellsi* Baker, 1917, type locality, northern Yunnan, with *arceuthinus* Bangs and Peters, 1928, type locality, Wa Shan, eastern Sikang, as a synonym; and *dichroides* Przevalski, 1876, type locality, Kansu. The three first named subspecies are not very well differentiated.

In *dichroides,* the pattern of the upper parts shows a contrast between the color of the crest which is gray and that of the back which is dull brownish olive, not gray. In the other three races, the crest and

[1] See notes below by Snow, who believes *abadiei* is sufficiently distinct and should be recognized.

back are both concolorous and grayish. *Kangrae* and nominate *dichrous* differ from *dichroides* and *wellsi* by showing a contrast in the color of the under parts, their throat being dusky brownish gray, whereas the rest of the under parts are buffy brown, but this contrast is not very sharp. *Kangrae* differs from nominate *dichrous* only by being generally paler.

As shown, *wellsi* thus differs from the other races on a combination of characters, but nevertheless it is not a very well-marked race and is very similar to nominate *dichrous*. It was described by Baker as being "much darker above and paler below" than nominate *dichrous*, but this statement is very exaggerated. In fact, Kinnear (1937, *in* Kinnear and Ludlow, Ibis, p. 24) stated that he could not see any difference, and he rejected the validity of *wellsi*. It was questioned also by Mayr (1940, Ibis, p. 703) who did not recognize *wellsi*. I find, however, that, when compared in the same plumage and in series, *wellsi* is a little paler below and averages somewhat darker above, but these differences are very slight, particularly above, and probably would not be considered to be of taxonomic importance by most authors. *Wellsi* is nevertheless constantly separable through the fact that it does not show any contrast between the color of the throat and that of the breast, although, as emphasized above, this difference is relatively slight.

Arceuthinus, on the other hand, is invalid and is a synonym of *wellsi*, as I can match perfectly specimens from the Wa Shan with specimens from northern Yunnan. The material examined from the Wa Shan was very kindly lent to me by Mr. J. C. Greenway, Jr., and consists of the original material of *arceuthinus*, including its type. When studying this species one should compare, if possible, only specimens that show the same degree of wear, as the birds are grayer and paler, less brownish and dark, when in fresh or relatively fresh plumage than in worn plumage.

Parus rubidiventris

The geographical variation of the Black Crested Tit has been discussed in detail by me in an earlier paper (1950, Amer. Mus. Novitates, no. 1459, pp. 41–47). In that paper I mentioned that *rubidiventris* and *rufonuchalis*, hitherto treated as separate species, appear to be conspecific, and I showed that the enlarged species consisted of three well-differentiated forms: one in the western part of the range in which the gray of the mantle is tinged with olive, the nuchal spot is rufous, the cheeks are white, and the belly is slaty gray; one in the eastern part of the range in which the gray of the mantle is not tinged with olive, the

nuchal spot is white, the cheeks are buffy rather than white, and the belly is buffy gray; and a third form which is intermediate, or combines some of the characters of the other two, but which has a rufous belly, the range of this last form connecting that of the other two in the central Himalayas. In addition, I subdivided the western and the eastern forms into two subspecies each, recognizing a total of five subspecies in all.

Reëxamination shows that I was mistaken and that the division of the western and of the eastern form into two races each is not warranted. The western subspecies is *rufonuchalis* Blyth, 1849, type locality, northern Punjab, with which *blanchardi* Meinertzhagen, 1938, type locality, eastern Afghanistan, should be synonymized. When I recognized the latter, I emphasized that its characters were slight and that it varied a great deal individually. I believe now that it is not sufficiently constant and too poorly differentiated from *rufonuchalis,* so that I have come to agree with Whistler (1944, Jour. Bombay Nat. Hist. Soc., vol. 44, p. 516) that it should not be recognized.

The intermediate subspecies is nominate *rubidiventris* Blyth, 1847, type locality, Nepal, and the eastern one is *beavani* Jerdon, 1863, type locality, Sikkim, with which *whistleri* Stresemann, 1931, type locality, "Kansu" [= northeastern Tsinghai] should be synonymized. Stresemann stated that there were no color differences between *beavani* and *whistleri* but that the latter was smaller and had a thinner bill. However, the bill in one paratype of the latter that I have examined and in two other specimens also collected by Beick that are virtually topotypes can be matched by that of specimens from Sikkim, and, as shown in table 5 of my 1950 paper, the bill, wing, and tail measurements of *whistleri* and of topotypical *beavani* are identical or virtually so. I had recognized *whistleri* because the three specimens mentioned were a little paler than specimens from Sikkim, and because Meise (1937, Jour. Ornith., vol. 85, p. 514), who had a larger series of *whistleri* than I had, had found that it was paler. However, this difference is so slight that it does not appear to me now to be of taxonomic importance. It is so very slight that, as stated above, Stresemann did not believe it exists.

Other synonyms are: *parvirostris* Keve, 1943, type locality, Tian Shan, a synonym of *rufonuchalis;* and *szetschwanensis* Meise, 1937, type locality, eastern Sikang, a synonym of *beavani.*

Parus ater

The Coal Tit has been studied recently by Snow (1955, Ardea, vol.

43, pp. 195–226). This paper is a detailed but very well-balanced study of the geographical variation, based on a very large amount of material, consisting of over a thousand specimens from virtually all parts of the range, and is rounded out by an annotated systematic list in which Snow recognizes 19 subspecies. This authoritative paper has been used by me as a guide, and, with one exception, Snow's division into 19 subspecies has been confirmed by the material I have examined. The exception consists of the fact that I believe an additional subspecies (*derjugini* Zarudny and Loudon, from northeastern Asia Minor) can be recognized, which makes a total of 20 in all. Several forms examined by Snow were not available to me, but, with one exception, these were forms he did not recognize, and his paper is so sound that I follow his opinion. The only valid subspecies not available to me is *phaeonotus* Blanford from southern Iran, but this subspecies, of which only about half a dozen specimens are known, is acknowledged to be a very distinct one. The following notes, based on my material, comment on a few forms.

Parus ater britannicus: Snow did not recognize *pinicolus* Clancey (1943, Bull. Brit. Ornith. Club, vol. 63, p. 66, type locality, northern Scotland), stating that specimens from Scotland did not differ constantly from *britannicus* Sharpe and Dresser, 1871, type locality, England, and that, in such specimens that may differ, the differences are too slight to be of taxonomic importance. *Pinicolus* was separated from *britannicus* as being less washed with buff above, purer and darker gray, but browner on the flanks; Snow added that the beak averages a little finer in Scottish birds. Nine adults in good plumage examined by me from the range of *pinicolus,* as defined by Clancey, are either identical in coloration and shape of the bill with specimens from central and southern England, or differ from them so very slightly that I agree with Snow that *pinicolus* is a synonym.

Parus ater vieirae: The populations of the Iberian Peninsula are very similar to those of Great Britain and represent, as do the latter, the ends of a cline running westward and southward from the typical populations of nominate *ater* from Scandinavia and northern Europe, the back becoming increasingly tinged with olive and the flanks more deeply washed with buff as the populations range farther west and south. *Vieirae* and *britannicus* are so similar that Snow remarks that, if their ranges were not so distinct, *vieirae* "would undoubtedly have to be synonymized" with *britannicus,* but the specimens I have examined show that the two forms are not identical. I find that those in fresh plumage from the Peninsula can be distinguished rather easily

from comparative specimens from Great Britain by being a little more richly colored on the flanks, a darker and slightly more rufous buff. It is possible also that the two races are separable as well in the immature plumage, as a specimen that I have examined from central Spain has the sooty area on the throat much more extensive (at least three times) than in two comparative specimens from England. This difference in the immature plumage was emphasized by Witherby (1928, Ibis, pp. 433–434) in his description of *cabrerae,* and if it proves to be constant it separates very clearly the populations of the Peninsula from those of Great Britain.

Cabrerae, the type locality of which is central Spain, is a stage on the cline, but, though it is slightly paler and somewhat larger than typical *vieirae* (the type locality of which is Portugal), I agree with Snow that it is very close to *vieirae* Nicholson, 1906, and is best synonymized with it. The wing lengths of the adult males of *vieirae* and *cabrerae* I have measured approach a little more closely than the measurements given by Snow, four *vieirae* measuring 59, 60, 60, 61, and four *cabrerae* 61, 63, 63, 65, as against, in males measured by Snow, 54–60 (58.3) in 15 of *vieirae* and 61.5–64.5 (62.8) in 12 of *cabrerae.*

Parus ater sardus: The populations of Corsica and Sardinia (*sardus* Kleinschmidt, 1903, type locality, Sardinia) represent another end of the cline but in this case only in the increased saturation of the color of the flanks. Snow states that *sardus* is intermediate in coloration between nominate *ater* and *britannicus* and is therefore paler than the latter, but in my material this is true only as far as the color of the back is concerned. On the flanks, specimens from Corsica and Sardinia are not paler than *britannicus* but are distinctly darker instead, more rufous, less buffy, and are in fact very slightly darker and slightly more rufous than in typical *vieirae* from Portugal and northwestern Spain, discussed above. The color of the flanks in *sardus,* though distinctly paler, shows a tendency towards the coloration of these parts in *cypriotes* in which they are very dark rufous buff, virtually brown. Hartert (1905, Die Vögel der paläarktischen Fauna, p. 358) had already mentioned the dark color of the flanks in *sardus,* stating these were *"stark rostbräunlicher,"* but he added that specimens varied somewhat individually and *sardus* required further study. It seems, however, to be a valid race.

The northern populations of nominate *ater* are eruptive migrants, and in Europe, according to Snow, populations [or individuals] migrate at least as far south as Switzerland. Some of these winter in Corsica and Sardinia. I am not aware that this has been mentioned in the

literature, although Hartert (*loc. cit.*) had mentioned that specimens he had examined from these islands did not appear to be *sardus*. These specimens, I find, are nominate *ater*. They consist of four collected on November 19, 1904, at Sassari, Sardinia, which are typical nominate *ater,* matching perfectly specimens from Scandinavia and northern Europe, and two others collected on April 10 and May 9, 1904, in Corsica which match the coloration of the form *"abietum."* The latter is a stage in the cline mentioned above under *vieirae* and is recognized by a few authors, though it is but very slightly differentiated from topotypical nominate *ater*.

Parus ater atlas and *Parus ater ledouci:* These two races of northwestern Africa are very closely related, but in *ledouci* the whole plumage is very strongly suffused with bright yellow, and it is thus strikingly different from *atlas* in which all yellow pigments are lacking in the adult. However, as stated by Snow in 1955 and in another paper (1952, Ibis, pp. 489–490), the difference is superficial, as the birds are similar in all other characters, including call notes. *Ledouci* ranges eastward as far as Djelfa in the Saharan Atlas and to the Ouarsenis Mountains in the north, or to about longitude 1° E., while *atlas* is found only in Morocco in the Atlas and in the Rif. Snow states that the two are separated by a gap in distribution of about 300 miles, and they must be well separated indeed to remain so distinct. However, this gap seems to be bridged, at least occasionally, because an adult specimen that I have examined is perfectly intermediate, and *ledouci* and *atlas* are so distinct that it is very easy to identify such an intermediate with certainty. This specimen was collected at Hamman R'Hira on April 14, 1904, by Witherby. This locality is about 65 kilometers southeast of Algiers, or about at longitude 2° 25′ E. It is possible also that the two races may occasionally interbreed in the south, because Snow (1955) remarks that specimens from the Saharan Atlas "have only a faint yellow wash, thus approaching *atlas*."

Parus ater derjugini: Snow has synonymized *derjugini* Zarudny and Loudon, 1903, type locality, Lasistan, northeastern Asia Minor, with *michalowskii* Bogdanov, 1879, type locality, Suram Pass, western Transcaucasia. He did not examine *derjugini,* which I believe is a valid race, but stated that he was following the opinion of Dementiev and Gladkov [editors, 1954, Birds of the Soviet Union, vol. 5, p. 748] in synonymizing it with *michalowskii*. However, Voinstvenski (the author of the section on the Paridae in that work) did not synonymize *derjugini* with *michalowskii*. In fact, he did not even mention it. In an earlier paper (1950, Amer. Mus. Novitates, no. 1459, p. 4) I mentioned that two

specimens from Lasistan that I had examined were grayer above than *michalowskii* and had a longer and thinner bill. I have compared my material again and find that the specimens from Lasistan show only a very faint trace of olive on the back, whereas in *michalowskii* the back is olive brown. The difference is very clear cut, and the specimens from Lasistan differ also in that their flanks are grayish, not buffy as in *michalowskii*. The coloration of the two specimens is very similar to that of nominate *ater,* though the flanks are very slightly paler and grayer than in typical nominate *ater,* and the back is slightly tinged with olive, as in the form *"abietum"* of nominate *ater* mentioned above under *sardus*.

The bill is different in *derjugini* than in either nominate *ater* or *michalowskii*. It is distinctly longer, more attenuated on its distal half than in either, distinctly thicker in profile than in nominate *ater,* but less thick proportionately than in *michalowskii*. The difference in the thickness is not apparent in measurements but is quite discernible to the eye. In length, the bill, measured from the skull, is 13.2 in one specimen of *derjugini* sexed as male, and 14 in the other which was sexed as a female. In 10 males and 10 females of nominate *ater* the bill measures 10–11.5 (10.8) and in *michalowskii* 10.5, 11.2, 11.5, 12.2 in four males, and 11 and 12.2 in two females, averaging 11.3 for the six specimens. Hitherto *moltchanovi* from the Crimea, in which the beak measures 12.5 and 12.5 in two males and 12 in one female that I have examined, was believed to be the race of *Parus ater* that had the longest bill (see also the long list of measurements given by Snow). It is of interest to recall that *derjugini* was described because of its long bill, a character confirmed by my two specimens.

The wing length in the two specimens of *derjugini* measures 68 in the male and 65 in the female, the wing tip being slightly worn. These measurements are similar to those of *michalowskii* (66–71, average 68, in the six specimens mentioned) rather than to those of nominate *ater* in which the wing length measures 57–66, with an average of about 62 in males and an average about 1.5 shorter in females.

Snow has suggested that the populations of nominate *ater* in northwestern Asia Minor are connected by intermediate populations to those of *michalowskii* in Transcaucasia and the Caucasus, and that *derjugini* may be an intermediate form. However, if one may judge by the two specimens, *derjugini* is not truly intermediate. It combines some of the characters of nominate *ater* (similar coloration) and *michalowskii* (long wing), but it has a well-marked character of its own (the long and attenuated bill) and it would be misleading to synonymize it with either.

The birds of northern Asia Minor are scarcely known, and it is possible that the population of Lasistan is isolated, which is suggested by the different bill. In *Parus ater,* as shown by Snow, the shape and size of the bill are correlated to the habitat (coniferous versus broad-leafed forest), and the different bill of *derjugini* suggests that the habitat of this race differs to some unknown extent from that of nominate *ater* and *michalowskii.*

Parus varius

The Varied Tit ranges from the southern Kuriles southward through the Japanese Archipelago, and the Ryu Kyus and Borodinos, to Formosa and to the Seven Islands of Izu, and its range includes also the islands of Quelpart, Tsushima, and Dagelet, extending to Korea and southeastern Manchuria on the mainland. It varies geographically, but, although some of the populations from the smaller islands are sharply differentiated (as in the Seven Islands) or clearly separable, it seems to me that it has been divided into too many subspecies by the Japanese authors. Some of the subspecies described appear to be invalid and others are much too slightly differentiated to warrant their recognition.

A critical revision of this species is needed, but unfortunately I lack specimens of some of the forms described, and my material of some of the others is very inadequate, consisting of single specimens. Nevertheless, the material examined and a study of the literature and of the original descriptions (many of them inadequate and confusing in that the forms described were compared, not to their nearest relative, but to widely separated and very distinct populations) lead me to believe that, until such a revision can be undertaken by a conservative author, the geographical variations can be adequately expressed by the recognition of only the forms listed below.

In order not to burden the discussion, the names of the authors, dates of publication, and type localities of the forms discussed are given here and are not repeated.

Those recognized by the "Hand-list of the Japanese birds" (1942, pp. 37–39) are:

varius Temminck and Schlegel, 1848, Hondo
ijimae Nagamichi Kuroda, 1922, Tsushima
namiyei Nagamichi Kuroda, 1918, Nii Jima, northern Seven Islands of Izu
utsurioensis Nagamichi Kuroda and Mori, 1920, Dagelet
owstoni Ijima, 1893, Miyake Shima, central Seven Islands of Izu
sunsunpi Nagamichi Kuroda, 1919, Tanegashima

yakushimensis Nagamichi Kuroda, 1919, Yakushima
amamii Nagamichi Kuroda, 1922, Amami O Shima
orii Nagamichi Kuroda, 1923, Borodinos
olivaceus Nagamichi Kuroda, 1923, southern Ryu Kyus
castaneoventris Gould, 1862, Formosa

Other forms have been described. Among them may be mentioned *masaakii* Momiyama (1940, Kagaku no Nôgyô, vol. 20, p. 41, type locality, Hachijo, southern Seven Islands of Izu), and *saisiuensis* and *koreensis,* described by Nagamichi Kuroda and Mori, respectively, from Quelpart in 1920 and from Korea in 1924. The three last named were considered to be invalid by the "Hand-list" but need to be mentioned here, as *masaakii* was described since the publication of "Die Vögel der paläarktischen Fauna," and *saisiuensis* and *koreensis* were revived by Nagahisa Kuroda very recently (1955, Tori, vol. 13, pp. 16–27). Nagahisa Kuroda has also described still another form, namely, *sataensis* (1953, Tori, vol. 13, p. 115), from southern Kyushu.

Revision

1. Nominate *varius* with the following synonyms: *utsurioensis, saisiuensis, ijimae, koreensis,* and *sataensis. Utsurioensis* from Dagelet was compared only to *namiyei* and *owstoni,* but, as Hartert and Steinbacher (1933, Die Vögel der paläarktischen Fauna, suppl. vol., p. 183) correctly protested, it is not related directly at all to these forms and should have been compared instead to nominate *varius,* its nearest relative. Hartert and Steinbacher state that a single specimen from Dagelet (which I have also examined) has a longer wing that nominate *varius* and that it is somewhat browner on the head and breast, but I find that this specimen can be matched perfectly in coloration by specimens from Japan. The specimen is a male, and its wing length, which measures 82, as well as the length and general shape of the bill, is matched by the larger individuals from Hokkaido and Hondo.

The "Hand-list," as stated above, did not recognize *saisiuensis* and *koreensis,* but synonymized these names with nominate *varius,* and it seems to me that there was very little need for Nagahisa Kuroda to revive these forms and to describe still another. A single specimen that I have examined from Quelpart can be matched in every detail by specimens from Hokkaido and Hondo, which suggests that *saisiuensis* is not valid, and, though I did not examine specimens from Korea, Austin (1948, Bull. Mus. Comp. Zoöl., vol. 101, p. 191) agrees with the "Hand-list" that *koreensis* is not valid either.

A cline of increasing saturation and decreasing size runs from south-

ern Japan, from Shikoku and Kyushu, as well as Tsushima, to Tanegashima and Yakushima, but this cline is apparently very slight, at least in Japan, and Austin (1953, *in* Austin and Kuroda, Bull. Mus. Comp. Zoöl., vol. 109, p. 513), who has examined more material than I have, states that *ijimae* (which inhabits Tsushima, Shikoku, and Kyushu) is only slightly darker and smaller than nominate *varius*. The only specimen of *ijimae* available to me, and which is a topotype, can be matched perfectly by most of the specimens that I have examined from Hokkaido and Hondo, so that I believe *ijimae* is best synonymized with nominate *varius*. *Ijimae* may differ from the latter in series, but in my opinion the difference between nominate *varius* and *sunsunpi,* though clear cut, is not sufficiently great to permit the nomenclatural recognition of an intermediate such as *ijimae*. Nagahisa Kuroda described *sataensis* on only two specimens, and it is not clear to me in what way, if any, this new form differs from *ijimae*.

In short, while I wish to emphasize that my comparative material is insufficient, I believe that such differences as may exist are discernible only in series and are probably neither sufficiently well marked nor constant enough to warrant the nomenclatural recognition of the forms synonymized above with nominate *varius*.

2. *Sunsunpi:* This race, which is restricted to Tanegashima Island, to the south of Kyushu, is darker gray on the back than nominate *varius* and averages slightly darker chestnut below and is somewhat paler throughout than *yakushimensis* which replaces it on Yakushima south of Tanegashima. The difference between it and the latter is not great, however, and in my opinion is rather slight and much less sharp than stated by Hartert (1921, Die Vögel der paläarktischen Fauna, p. 2114), but the difference between *sunsunpi* and *yakushimensis* is fairly constant and seems sufficient to warrant the recognition of the latter. Both races were described in the same paper on the same page. The comparative material examined by me consists of 19 specimens from Tanegashima and 12 from Yakushima.

3. *Yakushimensis:* This race is restricted to Yakushima.

4. *Amamii:* This race has a more extensive range than the preceding two—from Amami O Shima south to Okinawa. It differs from them by having the chestnut patch on the anterior border of the mantle more reduced in extent and virtually obsolete in some specimens and by being duller chestnut below and slightly duller gray above, with a faint suggestion of brownish or olive; *amamii* averages smaller also and shows a tendency to have a longer and stouter bill.

5. *Orii:* This race, which is restricted to the small Borodino Islands,

east of the central Ryu Kyus, is very well differentiated. It differs clearly from all the preceding by being tinged with olive above, much more so than in *amamii* from which it differs also by having a large chestnut patch on the anterior border of the mantle. It is also more darkly washed with chestnut on the forecrown and sides of the head and has a longer and stouter bill than all the preceding races.

6. *Olivaceus:* This race, which is apparently restricted to the southern Ryu Kyus, was not examined by me, and, though it is probably valid, its validity should be confirmed by comparing it to *amamii* which replaces it to the north and to *castaneoventris* on neighboring Formosa. It was not compared to these in its original description and, as far as I am aware from the literature, has not been compared directly to them since. The fact that Kuroda, in the description of *olivaceus,* states that its back is washed with olive and that the chestnut patch on the mantle is indistinct in some specimens and obsolete in others suggests that it may not differ very much from *amamii.* The wing length of the seven males and females of *olivaceus* given by Kuroda is 70–74 in males and 65.5–66.5 in females, and these measurements are larger than the published measurements of *castaneoventris* (which unfortunately I have not examined). Very few measurements of the latter have been published. Hartert (1905, *op. cit.,* p. 355) gave its wing measurements as "about 59.5–61.5," and the only other measurements I can find taken since are those published by Yamashina (1937, Tori, vol. 9, p. 388) who gives the wing length of five specimens from Formosa, collected by Orii in 1932, as 63.5, 64 in two males, 60, 62 in two females, and 62 in an unsexed adult.

7. *Castaneoventris:* This race is restricted to Formosa where it is rare according to Hachisuka (1951, Quart. Jour. Taiwan Mus., vol. 4, p. 25).

8. *Namiyei:* This race is found on the northern Seven Islands of Izu on To Shima, Nii Jima, and Kozu Shima, but not on O Shima, the northernmost island closest to Hondo where the population is not separable from nominate *varius* according to Austin (1953, *loc. cit.*). This author states that *namiyei* is intermediate in characters between the latter and *owstoni* but well differentiated from either. It was not examined by me.

9. *Owstoni:* This race is found on the central and southern Seven Islands of Izu, on Miyake Shima, Mikura Shima, and Hachijo. It is deep chestnut on the forecrown, sides of the head, and under parts, is distinctly tinged with olive above, and has a long and stout bill. It is very similar to *orii* from the Borodinos, but the latter is generally paler

and its wing is shorter. *Masaaki* described by Momiyama is a synonym of *owstoni,* according to the "Hand-list of the Japanese birds" (*loc. cit.*), and this is confirmed by specimens I have compared from Miyake Shima and Hachijo. These are all identical.

MEASUREMENTS: The size variation is shown by the wing length of adult males. The measurements were taken by me, with additions taken from the literature.

Nominate *varius* from Hondo and Hokkaido: 75, 75, 77, 78, 79, 79, 79, 82 (78)

Sunsunpi: 73, 75, 75, 76, 76, 76, 77, 80, 81, 81 (77)

Yakushimensis: 73, 73, 75, 75, 76, 76, 76, 77, 77, 80 (75.8)

Amamii: 75, 75; and 76, 77 according to Nagamichi Kuroda (1922, Annot. Zool. Japonenses, vol. 10, p. 118)

Orii: 76; and 71–79.5 in eight males and four females according to Nagamichi Kuroda (1923, Bull. Brit. Ornith. Club, vol. 43, p. 121)

Olivaceus: 70–74 in males according to Nagamichi Kuroda (1923, *ibid.,* p. 91)

Castaneoventris: 63.5, 64 according to Yamashina (*loc. cit.*)

Namiyei: 77, 78, 79, 82 according to Nagamichi Kuroda (1918, Dôbutsu Zasshi, vol. 30, p. 322)

Owstoni: 80, 81, 82

Parus major

In 1950 (Amer. Mus. Novitates, no. 1459, pp. 12–36) I reviewed a number of the Asiatic races of the Great Tit, and in the same year Delacour and I (L'Oiseau, pp. 90–121) published a joint review of the entire species. Distributional maps are given in both of these papers. I have now studied the Palearctic populations again and believe that a few changes are desirable in the treatment proposed by Delacour and myself. These changes are minor ones except in the case of *bokharensis* and its allies which I now believe are best removed from *P. major* and treated as a separate species, a question discussed below.

The Palearctic races are listed below without comment if no changes are made in the treatment by Delacour and myself. Forms described since 1950, or that we had overlooked, as well as a note by Austin on the status of *minor* (1953, *in* Austin and Kuroda, Bull. Mus. Comp. Zoöl., vol. 109, p. 511) are discussed. For the ranges of the races, their subspecific characters, original references, and type localities, see the joint review cited.

1. *Parus major major* Linnaeus, 1758, with the following synonyms: *karelini* Zarudny, 1910, type locality, southern Caspian districts of northern Iran; *alanorum* Floericke, 1926, type locality, northern Portugal; *bargaensis* Yamashina (1939, Tori, vol. 10, p. 481), type locality,

Dalai Nor, northwestern Manchuria; and *kapustini* Portenko (1954, Fauna U.S.S.R., no. 54, Birds, vol. 3, p. 109), type locality, Sretensk, Transbaicalia.[1]

Delacour and I recognized the validity of *karelini* but with full reservations. This form averages a little smaller than typical nominate *major* from Europe and was said by Stresemann (1928, Jour. Ornith., vol. 76, p. 366) to be somewhat paler yellow below. I have examined but one specimen of *karelini,* but, as stated in my 1950 paper and in our joint paper, this specimen is identical in coloration with nominate *major.* It is possible that specimens from the southern Caspian average somewhat paler below in series than nominate *major* and thus tend towards the paler *blanfordi* which replaces nominate *major* at the eastern corner of the Caspian and on the Iranian Plateau and in the Zagros, but I doubt that the difference is sufficient to warrant the recognition of *karelini.* The four males of *karelini* measured by Stresemann had a wing length of 70–72, and these measurements are smaller than those of nominate *major,* but a very much larger series of *karelini* measured by Zarudny and Bilkevitch (1913, Messager Ornith., pp. 24–27) consisting of 32 males had a wing length of 68.4–76.3. These measurements overlap those of nominate *major* in which the wing length of males ranges from 73 to 83. In view of this overlap and the fact that the difference in coloration can be only very slight at best, it seems to me now that *karelini* is much too poorly differentiated and should be synonymized with nominate *major.*

In 1950 Delacour and I referred the populations of the Iberian Peninsula to *excelsus* (type locality, Algeria), but upon reëxamination, which includes additional material, I now believe that Witherby (1928, Ibis, p. 432) was correct when he stated "Great Tits from the Spanish Peninsula do not, in my opinion, differ sufficiently clearly and constantly from the typical [nominate *major*] form to warrant separation." This statement was questioned by Ticehurst and Whistler (1933, Ibis, p. 104) and Jourdain (1937, Ibis, p. 117) who called the Peninsular populations by the name *alanorum,* because their specimens showed a "tendency" towards a reduction of the white wedge on the inner web of the outer pair of rectrices. It is correct that the birds of the Peninsula, taken as a series, show such a tendency, but it should be emphasized that this is no more than a tendency. Even if the birds of the Peninsula had a constantly smaller white wedge, this character would be much too slight, in my opinion, to warrant the recognition of a

[1] See, however, footnote on page 42 concerning the true status of *kapustini.*

separate subspecies for the Peninsula, intermediate between nominate *major* and *excelsus*. In the latter, the white wedge is always distinctly smaller than in nominate *major,* and in addition the populations of northwestern Africa differ constantly from those of the Peninsula and from populations farther north in continental Europe by being darker yellow below, with the color richer in tone. Ticehurst and Whistler commented also that their specimens had a shorter wing length than the "typical race," their seven males measuring 69.5–76, but these measurements (see above) overlap to some extent those of nominate *major,* and eight males and unsexed adults measured by Delacour and myself had a wing length of 73–77, 83. This last specimen with a wing of 83 was collected in February, however, and may have been a visitor from the far north.

The description of *bargaensis* was overlooked by Delacour and myself. This form was described as similar to nominate *major* in coloration, but smaller, and was based on a single male from Manchuria with a wing of 73 and a tail of 57. These measurements are small, but it seems to me that a dimensional race should not have been described on only one specimen. The wing length of nominate *major* is discussed above; it measured 73 to 83 and its tail length 58 to 67.

Portenko has recently separated as *kapustini* the population of Transbaicalia on the basis that it has a longer wing than nominate *major* and is grayer above. I have not examined specimens from this region, but, in view of the conflicting opinions regarding the characters of this population, it seems best not to recognize *kapustini* until further study.

Domaniewski (1933, Acta Ornith. Mus. Zool. Polonici, vol. 1, p. 167) was apparently the first to mention that the population of Transbaicalia may be grayer above than nominate *major* from Europe, but, as he had only one specimen from Transbaicalia, he could not be certain and refrained from proposing a new race. Johansen (1952, Jour. Ornith., vol. 92, p. 174) mentioned also that the birds of Transbaicalia were grayer and stated that their wing length in males averaged 79 as against 77 for those in Europe, but he apparently did not consider the differences sufficient to warrant nomenclatural separation. Kozlova (1933, Ibis, p. 302) mentioned no differences and called the birds of Transbaicalia nominate *major,* while Stegmann on two occasions (1929, Ann. Mus. Zool., vol. 29, p. 218; 1931, Jour. Ornith., vol. 79, p. 177) denied categorically that the population of Transbaicalia differs constantly from nominate *major.*[1]

[1] See footnote on page 42.

2. *Parus m. newtoni* Prazák, 1894.
3. *Parus m. excelsus* Buvry, 1857.
4. *Parus m. corsus* Kleinschmidt, 1903.
5. *Parus m. aphrodite* Madarász, 1901.
6. *Parus m. terraesanctae* Hartert, 1910, type locality, Jerusalem. This is one of the least well-differentiated races. It is an intermediate between *aphrodite* and *blanfordi.*
7. *Parus m. blanfordi* Prazák, 1894.
8. *Parus m. intermedius* Zarudny, 1890.
9. *Parus m. ziaratensis* Whistler, 1929.
10. *Parus m. decolorans* Koelz, 1939.
11. *Parus m. caschmirensis,* Hartert, 1905.
12. *Parus m. nigriloris* Hellmayr, 1900.
13. *Parus m. tibetanus* Hartert, 1905.
14. *Parus m. minor* Temminck and Schlegel, 1848, type locality, Japan. Austin (*loc. cit.*) commented on the fact that Delacour and I had synonymized all the forms described from Hupeh north to Korea, Manchuria, and Ussuriland with *minor* of Japan. In his opinion, this was not correct, and he states, "My extensive series shows comparable fresh birds of Japan to be separable from Korean specimens by their brighter and more extensive yellow wash on the backs, and lighter edgings to the tail feathers. The populations of Korea, Ussuria, and northern China are inseparable, the differences I previously noted [1948, Bull. Mus. Comp. Zoöl., vol. 101, p. 189] being caused by age-foxing, so *wladiwostokensis* [Kleinschmidt, 1913, type locality, Vladivostok, Ussuriland] becomes a synonym of *artatus* [Thayer and Bangs, 1909, type locality, Ichang, Hupeh]." While a difference may exist between very freshly collected specimens from Korea and Japan, it remains to be seen whether such a difference exists between the populations of Hupeh and Ussuriland, as Austin does not say that he has compared freshly collected specimens from these regions. I can only comment that no constant difference can be seen between my older specimens from China, and those from Korea, Ussuriland, and Japan, and I believe that the difference noticed by Austin is not truly of taxonomic importance if it is so evanescent. Furthermore, two skins in unworn plumage collected in Japan in 1949 fall perfectly within the range of individual variation of older specimens in comparative plumage from China, Korea, and Ussuriland. In short, I believe that any difference that exists is probably one of average, discernible only in large series and not sufficient to warrant the nomenclatural separation of the populations from the continent from those of Japan.

15. *Parus m. kagoshimae* Taka-Tsukasa, 1919. This form from southern Kyushu was not examined by Delacour and myself, and I have not examined it since. However, *kagoshimae* is a valid race according to Austin (*loc. cit.*), being darker on the flanks than *minor*.

16. *Parus m. dageletensis* Kuroda and Mori, 1920. This race from the small island of Dagelet or Utsuryo in the Sea of Japan has not been examined by me, but, if one may judge by its description, seems to be well differentiated.

17. *Parus m. amamiensis* Kleinschmidt, 1922.

18. *Parus m. okinawae* Hartert, 1905.

In addition to the 18 races listed above a number of other races are distributed outside the Palearctic region. Delacour and I recognized nine in the *cinereus* group (forms with a gray back and whitish under parts), but it seems now that the validity of at least one of these (*sarawacensis*) is in question. This form is known from only a single specimen, said to have been collected in Sarawak in northern Borneo, but apparently the origin of this specimen is uncertain. Two additional extralimital and valid races of the *minor* group (forms with a green back and whitish under parts) consist of *nubicolus* in eastern Burma, Siam, and northwestern Indochina, and of the very interesting *commixtus* of southern China, a race of hybrid origin connecting the *cinereus* and *minor groups*.

Parus bokharensis

In 1950, I discussed the relationships of *bokharensis*[1] and its allies with *P. major* and emphasized that the two are very distinct morphologically and apparently overlap in some regions (Transcaspia and northern Khorasan) during the breeding season without showing any signs whatever of hybridization. In other regions (Zaisan and the Urungu River) their ranges approach closely, but no two related tits could be more distinct morphologically. In other regions (Pamirs and neighboring northeastern Afghanistan) the situation is less clear, however, and it is possible that in those regions the two hybridize to some extent. I suggested that *bokharensis* and *major* might be separate species, but I hesitated to treat them as such, because on the whole they are geographical representatives, and the situation is not clear in the Pamirs and Afghanistan.

[1] If, as I believe, *bokharensis* is probably a separate species, it is desirable that it should have a vernacular name. I have not found that it has any and propose it should be called the Turkestan Tit, as its ranges is restricted to Russian and Chinese Turkestan.

After giving much thought to the question and discussing it with Dr. Ernst Mayr, I have come to the conclusion, shared by Mayr, that *bokharensis* has probably reached species level. Additional collecting and, above all, field studies are necessary to settle this question, but we feel that it is more constructive to consider that they are separate species. To continue to treat *bokharensis* as a subspecies of *major* is to lose sight of it in the welter of the many subspecies of *major,* many of which are based on rather trivial characters.

The morphological differences have been discussed in my earlier paper but may be briefly mentioned again. The tail (see Vaurie, 1950, *ibid.,* table 3) is very much longer in *bokharensis,* which results in different proportions. It is always distinctly shorter than the wing in *P. major,* the average tail index being 83 in 29 populations; whereas in *bokharensis* it is always equal to and usually longer than the wing, the average tail index being 104 in eight populations. The tarsus is slightly thicker and longer in *bokharensis;* in adult males of the same body size (as expressed by the wing length), the tarsus averages about 17.5 mm. in *major* as against 20.5 in *bokharensis.* The plumage of *bokharensis* is strikingly pale, the cheek patches are larger, and the young are not tinged with yellow as in *major.* A very faint trace of yellow is shown above in an occasional immature specimen of *bokharensis* (two out of 17 examined), but the presence of this pigment does not necessarily prove that *bokharensis* is conspecific with *major.* The presence or persistence of this pigment in the young seems to be an ancestral character in many tits and may be present in species that are closely related, such as *major* and *monticolus,* or not closely related, such as *major* and *caeruleus* or some races of *ater.*

In my 1950 paper, as also in the joint review by Delacour and me, I recognized several subspecies in the *bokharensis* "group," but Voinstvenski in the "Birds of the Soviet Union" (1954, vol. 5, p. 732) has synonymized all of them with *bokharensis* Lichtenstein, 1823, type locality, Bukhara, with the exception of *turkestanicus* Zarudny and Loudon, 1905, type locality, northern Dzungaria. He does not mention this latter, perhaps because it does not occur within the limits of the Soviet Union, though as *turkestanicus* is omitted from the map of distribution (map 130, *op. cit.,* p. 727) he may consider it invalid.

I think it is best to follow Voinstvenski (except as regards *turkestanicus*), because all the other forms are only slightly differentiated. Nevertheless, *panderi* Zarudny and Härms, 1913, type locality, Transcaspia (overlooked by me in 1950 but synonymized with *bokharensis* by Delacour and myself) is slightly paler above than *bokharensis,* less

bluish, more sandy; *ferghanensis* Buturlin, 1912, type locality, Alai, Ferghana, is slightly darker and bluer above than *bokharensis;* and *iliensis* Zarudny and Bilkevitch, 1912, type locality, Djarkent, has a slightly larger bill, thicker and wider, and about 1 mm. longer on the average than that of *bokharensis,* and also averages larger, its wing length ranging from 68 to 77 as against 63 to 72 in true *bokharensis. Panderi* occupies the oases of the Transcaspian deserts; *bokharensis* ranges from Bukhara and the region east of Bukhara south to Afghan Turkestan; *ferghanensis,* the mountains from the Tian Shan south through the Pamirs to northeastern Afghanistan (Badakhshan); and *iliensis,* the arid Ili River Basin. We see thus that, though slightly differentiated, the four forms occupy ecologically distinct regions.

In *turkestanicus* the bill is still larger than in *iliensis.* This is denied by Meinertzhagen (1938, Ibis, p. 673) but confirmed by Delacour and also Kinnear (1933, *in* Ludlow and Kinnear, Ibis, pp. 449–450). *Turkestanicus* is a peripheral and well-isolated form, connected to *bokharensis* via *iliensis,* and the fact that it has a large bill is not without zoogeographical interest. In *P. major* we find that two of its peripheral races (*newtoni* in the British Isles and *hainanus* on Hainan) also have large bills. In passerine birds I have noticed that in not a few of the species, the range of which extends to the central Asiatic heartland, their populations in this region have larger bills. *Turkestanicus* is also distinctly larger than true *bokharensis,* four males from Dzungaria having a wing length of 75–76 (75.5) as against 66–70 (68.5) in 10 from Afghan Turkestan and 63–72.5 (68.5) in three males and two unsexed adults from Bukhara.

Parus monticolus

The Green-backed Tit varies geographically, and on the continent this variation consists of a cline of increasing saturation running from west to east, from the Himalayas to China. This cline is not very strongly marked, but the populations of the Himalayas are not so dark green above and the yellow of their under parts is less rich in tone than in the populations that range from northeastern Burma and Yunnan to the mountains of western Szechwan (west of Wenchwan). At the extreme eastern end of the range, namely, from southern Kansu and the mountains that rim the Red Basin of Szechwan on the north, northward to the Tsinling Range in Shensi, the cline is reversed somewhat, and these populations are a little duller. They are, however, still closer in their coloration to the birds of Yunnan than they are to those of the Himalayas, particularly those from the western Himalayas. It seems to me, therefore, that it is sufficient to recognize only two subspecies

along this cline: nominate *monticolus* Vigors, 1831, type locality, Simla, and *yunnanensis* La Touche, 1922, type locality, Yunnan.

The population of the eastern Himalayas was described as *lepcharum* by R. and A. Meinertzhagen in 1926, with type locality, Sikkim, but this intermediate form seems too poorly differentiated from nominate *monticolus* to warrant its recognition. I had recognized *lepcharum* in 1950 (Amer. Mus. Novitates, no. 1459, pp. 36–39), but after reëxamination I now agree with Ticehurst (1935, Ibis, p. 40) and Kinnear (1937, *in* Ludlow and Kinnear, Ibis, p. 23) who have synonymized it with nominate *monticolus*.

In addition to nominate *monticolus* and *yunnanensis* two other races can be recognized: *legendrei* Delacour and Jabouille, 1927, type locality, southern Annam, which is very dark, with a broader black band below, and *insperatus* Swinhoe, 1866, type locality, Formosa, with wider and purer white borders on the upper wing coverts and larger white spots on the tertials.

Sylviparus modestus

In an earlier note on the Yellow-browed Tit (1950, Amer. Mus. Novitates, no. 1459, pp. 49–51) I remarked that this species had been split into too many subspecies and that it seemed sufficient to recognize only three: *simlaensis* Baker, 1917, type locality, Simla; nominate *modestus* Burton, 1836, type locality, Nepal; and *saturatior* Rippon, 1906, type locality, Chin Hills. *Simlaensis* is distinctly paler and brighter, more yellowish, than nominate *modestus,* but I emphasized that *saturatior* was only slightly darker than nominate *modestus.* Upon reëxamination, I now believe that the difference is truly so slight that it is best to synonymize *saturatior* with nominate *modestus.*

I believe also that *klossi* Delacour and Jabouille, 1930, type locality, Langbian Peaks, southern Annam, requires further study, but unfortunately I have only one specimen, a topotype. This specimen is extremely similar to *simlaensis,* but it differs from it in some details. It is duller and grayer on the crown, more greenish, less yellowish, on the back and edges of the tail, and the little yellow postocular streak is barely suggested. All the differences are very slight, but it seems desirable to mention them in the hope that they will be confirmed and perhaps will be found to be better indicated in additional material.[1] If not, *klossi* must be synonymized with *simlaensis,* and as a result the latter will acquire a very unnatural split range consisting of the northwestern Himalayas and of the Langbian Peaks of southern Annam.

[1] But see comment below by Snow.

SUPPLEMENTARY NOTES

By D. W. Snow

Vaurie kindly sent me the manuscript of the present paper when my own work on the Paridae for "Peters' check-list" was nearly finished. Most of my decisions on the subspecies that should be recognized, reached after examination of largely different material, agree fully with Vaurie's, which has relieved me of the necessity of publishing detailed taxonomic notes on the Palearctic forms. In a number of cases, where we had disagreed over the recognition of subspecies (a process which is still extremely arbitrary, especially where clinal variation is the rule, as in many of the tits), I have altered my treatment in order to conform with Vaurie's, as I believe that the usefulness of our two lists for practical purposes will be reduced by the extent to which they disagree.

It is necessary to stress that in "Peters' check-list," as in Vaurie's check list, only the more well-marked forms will, as a rule, be admitted to subspecific rank. This does not mean that none of the forms listed as synonyms are distinct, or that they were improperly described, but simply that I do not consider that they are sufficiently distinct for nomenclatural recognition. The reason for this is twofold. First, I believe that there is a general need, in species with obscure coloring and much clinal variation, to use different names only for easily recognizable subspecies, especially in view of the fact that slight differences which are appreciable in freshly collected specimens do not always persist after a few years in a museum. Second, there should so far as possible be uniformity of treatment over the whole range of a species. The tits have been split into far more subspecies in Europe than elsewhere, because more taxonomists have been at work on them. The only way to give equal taxonomic value to geographical variation in all parts of the range of a species is to synonymize the less well-marked subspecies.

I have no comments to make on *Parus cinctus, P. rubidiventris,* and *P. monticolus,* which are satisfactorily dealt with in the present paper or in Vaurie's previous publication (1950, Amer. Mus. Novitates, no. 1459). Vaurie has pointed out one or two mistakes in my recent revision of *P. ater* (1955, Ardea, vol. 43, p. 195), which will be corrected in my treatment of this species in "Peters' check-list"; otherwise the subspecies will be as in that paper. As regards the remaining species, the following notes bring out some minor points of difference between Vaurie and myself over the recognition of subspecies and amplify Vaurie's observations in a few particulars.

Parus palustris

Independently of Vaurie, I had reached very similar conclusions as to the subspecies of *P. palustris* that should be recognized, especially in the western section of the species.

THE WESTERN SUBSPECIES: The main color clines described by Vaurie above are somewhat complicated by the fact that in the Alps and Pyrenees the Marsh Tits are slightly paler and grayer than in the neighboring lowlands. This is well shown in excellent series of autumn-collected specimens from Interlaken and the central Pyrenees which I have been able to examine through the courtesy of Dr. J. M. Harrison.

In addition to the color cline, there is a cline of decreasing size from Scandinavia southwest to western France, as shown by the following measurements of males:

Sweden (Uppsala district)	21	65–69 (67.0)
Baltic States	11	63.5–67 (65.6)
Denmark (Zeeland)	22	63.5–68 (65.2)
Holland	11	62.5–67 (64.8)
West-central France (Blois)	18	61.5–66 (64.0)
Western France (Loire Inférieure)	6	62–66 (63.8)

I have not measured enough birds from Brittany to give a mean, but, to judge from the cline, it is probable that birds from western Brittany have a mean wing length of about 63 mm., which is the same as that of English birds [34 males: 60–67.5 (63.0)]. I agree with Vaurie that the exceedingly slight color difference between the Breton and British birds is in itself not sufficient for recognition of *darti,* which must be synonymized with *dresseri.*

I have examined the specimens on which *congrevei* was based. They were collected in the spring and are badly worn, which accounts for their pale, rather gray color. They were compared only with specimens from Romania and Macedonia, but I find that they can be matched by similarly worn specimens from northern Europe.

THE EASTERN SUBSPECIES: In working through the material in the British Museum and a little from other museums, and after study of the literature, I had decided to recognize *altaicus* and *crassirostris,* both of which Vaurie synonymizes with *brevirostris;* otherwise my treatment agreed with Vaurie's. My reason for dividing the eastern and central Siberian populations into three subspecies was that, as Vaurie says, the central form (*brevirostris*) is paler than the two forms on either side, a situation that can be conveniently described by the use of three names.

But I had seen very inadequate material. I believe that *crassirostris,* if not *altaicus,* may ultimately need to be separated from *brevirostris,* but I now agree with Vaurie that until these forms have been properly revised it is best to follow Voinstvenski and synonymize them.

Parus p. hypermelas: This subspecies replaces *hellmayri* in the mountains of western China. No intermediates appear to have been collected, although in Shensi *hellmayri* has been collected at Hsu-hsien, only about 100 miles from where the type of *hypermelas* was collected, and in Szechwan *hellmayri* has been collected at Chin-chien-san (not located, but presumably in the lowlands of the east or center) and *hypermelas* has been collected in the west of the province. It is possible, therefore, that *hellmayri* and *hypermelas* are reproductively isolated from each other, which would support Stresemann's opinion that they are specifically distinct, but this cannot be determined until much more extensive work has been done in these areas.

Parus montanus

Parus montanus, because of its predominantly clinal variation over much of its range, poses the usual problems of how to make satisfactory divisions for nomenclatural purposes, but in southern parts of central and eastern Europe local differentiation appears to be a little better developed in this species than, for example, in *P. palustris,* probably because *P. montanus* is characteristic of montane conifer woods and so occurs in more discrete populations. The variation is slight, however, and, as Vaurie mentions, this species has been split into far too many subspecies. The long discussions in the literature (see especially Jouard) have made it clear that no general agreement is possible as long as it is decided to recognize very small color differences subspecifically, and, with Vaurie, I agree that much larger groupings are necessary.

Parus m. montanus: I am synonymizing *transsylvanicus* and *rhodopeus* with *montanus.* These are fine-split races, apparently intermediate in color between Alpine birds (*montanus*) and *salicarius* to the north. But they are large, montane forms, close to *montanus* in measurements.

The West-East Cline Across Siberia: I prefer to recognize fewer stages on this cline subspecifically, by synonymizing *uralensis* with *borealis* and *anadyrensis* with *baicalensis.* This decision is necessarily arbitrary, as variation seems to be smoothly clinal, at least from Russia to east of Lake Baikal. However, *kamtschatkensis,* which is more or less isolated in the Kamchatka Peninsula, may be a more sharply demarcated form.

Parus cristatus

Parus c. abadiei, from Brittany, should be recognized. Birds from Brittany are at the end of the cline, described by Vaurie, of increasingly rufous brown coloration. *Abadiei* was described as being small (compared with other French populations) and distinguished by its bright rufous rump, the rufous tinge to the whole of the upper surface, and deep rufous flanks. I have examined fresh autumn specimens from Brittany and find that Jouard's description holds good. Scottish birds, on the other hand, are a grayer, more olive brown, and in fact are closer to *weigoldi* from the southern Iberian Peninsula. If any continental European birds were to be synonymized with *scoticus,* it should be these southern Iberian birds. Many of them are not individually distinguishable, but in series they differ in color as described by Vaurie; in addition, Iberian birds tend to be a purer gray-brown on the back, not so olive-colored.

As in *P. palustris,* Alpine and Pyrenean birds are very similar to one another and a little paler than neighboring lowland populations. This variation is the basis of Jouard's subspecies *albifrons* (Pyrenees) and *poeninus* (Alps). Indeed Jouard, who always stressed minute differences, found that the latter was almost identical with nominate *cristatus,* and my own observations agree. I prefer, therefore, to regard Alpine birds as *cristatus* and not *mitratus,* as Vaurie does, but I realize that, while this may express more satisfactorily the situation in central Europe, it leaves the Pyrenean birds in an anomalous position as an isolated population of *cristatus*-like birds surrounded by *mitratus.* Trinomials cannot, however, adequately deal with situations such as this.

Parus dichrous

I had independently reached almost the same conclusions about the validity of the subspecies of this species as Vaurie, except for *arceuthinus,* which I had not seen and which I thought from the description would prove to be distinct from *wellsi.* I follow Vaurie in placing it in the synonymy of *wellsi.*

Biswas (1955, Bull. Brit. Ornith. Club, vol. 75, p. 88) has recently described a new subspecies, *izzardi,* from about 12,000 feet in the Bhote Kosi Valley of eastern Nepal. It is based on a single April specimen and is said to be "similar to nominate *dichrous* from Darjeeling and Sikkim [but type locality Nepal], but has a darker gray on the upper side, brown on head restricted to the extreme forehead, brown deeper

on the upper side, and a much longer tail." The single specimen, a male, measures wing 74, tail 51. These measurements do not lie outside the range of typical *dichrous.* My measurements of males are: wing 68.5–76 (one of 65.5 probably wrongly sexed), tail 46.5–54. Provisionally I have no hesitation in regarding *izzardi* as a synoynm of *dichrous.* In this species, as Vaurie emphasizes, wear produces a noticeable color change, and no new subspecies should be based on a single worn specimen.

Parus varius

From an examination of different material, which was, however, incomplete for parts of the range of the species, I had decided to recognize exactly the same subspecies as Vaurie, except for *sunsunpi* and *yakushimensis,* which I intended to synonymize with nominate *varius.* I had, however, seen fewer specimens of these two races than Vaurie, and it was not clear from these that they were really distinct from birds from Kyushu. In view of Vaurie's revision, based on better material from Tanegashima and Yakushima, I shall accept *sunsunpi* as a valid subspecies, but I prefer to treat *yakushimensis,* which Vaurie admits is only slightly different from *sunsunpi,* as a synonym.

Parus major

Many of the populations of the *major* group show differences in the extent of the white on the outer tail feathers, but this variation is usually apparent only in series, and, as Vaurie says, is by itself not a very useful taxonomic character. Nevertheless, it is a good indicator of affinities in otherwise not well-differentiated populations. I have measured the length of the white wedge in a large number of individuals, and Vaurie has kindly measured some others for me; some of these measurements are given in table 1. Populations from continental Europe show great individual variability in the extent of the white wedge. In the west, from France through Spain and into northwest Africa, there is a cline of gradually decreasing white, and this cline continues eastward in Africa, reaching its limit in northern Tunisia, where all the individuals examined have a very short white wedge or none at all. Spanish birds are on the whole closer to other European populations than to *excelsus* (type locality, Algeria), which supports Vaurie's decision to treat all Iberian birds as *major.* Birds from the Balearics, Crete, and Cyprus agree with one another in the extent of the white wedge. This supports Delacour and Vaurie's decision, which I follow, to treat them all as *aphrodite,* though phylogenetically I think that Balearic birds

TABLE 1

LENGTH (IN MILLIMETERS) OF WHITE WEDGE ON OUTER TAIL FEATHERS IN SOME POPULATIONS OF *Parus major*

	0–5	6–11	12–17	18–23	24–29	30–35	36–41
Southern Sweden (typical of northern and central Europe)	3	10	11	25	20	9	—
Cline from France to North Africa							
Western France	—	2	8	14	14	3	1
Northern Iberian Peninsula	—	2	3	3	2	—	—
Central Iberian Peninsula	8	16	12	11	11	—	—
Southern Iberian Peninsula	8	10	9	7	4	—	—
Morocco	37	25	3	6	5	—	—
Algeria	17	12	2	1	—	—	—
Tunisia	19	1	—	—	—	—	—
Cline from Asia Minor to Fars							
Asia Minor	—	2	4	3	3	3	—
Palestine	—	—	1	7	8	—	—
Iraq	—	—	1	2	4	1	—
Central Zagros region	—	—	—	4	7	4	4
Fars	—	—	—	—	4	4	4
Cline from Azerbaijan to south Caspian coast							
Lake Urmia area	—	—	1	2	8	6	1
Ardebil area	1	5	—	5	1	—	—
South Caspian	3	3	2	2	—	—	—

are closer to those of Spain. In the Near East there are two distinct groups. Birds from the south Caspian coastal area (*"karelini"*) have reduced white wedges, while those from Palestine, Iraq, and southwest Iran have extensive white wedges, the extent of white increasing clinally to a limit which is reached in Fars. The situation in Iran strongly suggests that the south Caspian birds are genetically rather well isolated from the rest. I agree with Vaurie that they are best synonymized with *major,* although in the extent of the white wedge *blanfordi* from west-central Iran is actually closer to *major* populations from the highlands of Azerbaijan than are the south Caspian birds.

Parus m. minor: Portenko, in a further publication on his new race *P. major kapustini* (1955, Trudy Zool. Inst., Acad. Nauk SSSR, vol. 18, p. 495), says that specimens of *P. major* from the Middle Amur (Ku-

mari, Blagovechensk) are transitional between *kapustini* and *wladiwostokensis* (= *minor*), the back being light gray-green and the under parts pale yellowish; wings of males 79.7, 77.8, 76.2, and 74.4. Further evidence is desirable before the significance of this statement can be assessed, but clearly the possibility must be borne in mind that reproductive isolation between *major* and *minor* in this area may not be so complete as Stegmann (1931) suggested.[1]

Sylviparus modestus

Independent examination of the very good material of this species in the British Museum convinced me that at most only three subspecies should be recognized at present, *simlaensis, modestus,* and *klossi.* All the dark forms (here treated as *modestus*), from Gahrwal east to Szechwan, Yunnan, and northern Indochina, are exceedingly similar. Some populations are a little darker than others (*saturatior, tonkinensis*) but not sufficiently so for taxonomic recognition. Nor can they be separated on measurements. I agree with Kinnear (1937, Ibis, vol. 14, p. 25) that the isolated population from northwest Fukien (*ricketti*) is also not separable from *modestus.* It does not differ in color from eastern Himalayan birds; it is a little smaller (males from Fukien 56, 56, 59, female 54, compared with males from Himalayas 59, 59.5, 61, 62, females 57.5, 59), but adequate series of measurements would doubtless show considerable overlap.

Klossi, from southern Annam, poses a problem. The specimens that I have examined are identical in color with *simlaensis;* I cannot con-

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[1] Professor Portenko confirms that *kapustini* and *wladiwostokensis* intergrade along the Middle Amur. We thus see that *major* and *minor* are not reproductively isolated, as *kapustini* belongs to the nominate *major* group and *wladiwostokensis* is considered by many authors to be a synonym of *minor.* Typical *kapustini,* though it resembles *major* (green back and yellow under parts) more than it does *minor* (green back but whitish under parts), shows, moreover, a certain approach to *minor.* In *kapustini* the green pigment on the back extends farther down than in *minor,* but its shade is virtually the same as in the latter, that is, distinctly more grayish blue-green, less bright and yellow, than in nominate *major.* In addition, the color of the under parts, though it is not whitish, is distinctly paler yellow in *kapustini.* The latter does not appear to be the same form that was described in 1939 from northwestern Manchuria as *bargaensis* by Yamashina. According to Yamashina, *bargaensis* is "quite similar" to nominate *major* in coloration, whereas, as emphasized above, *kapustini* differs clearly from nominate *major* in coloration.

I would like to express my appreciation to Professor Portenko, whom I had the pleasure to meet recently. He kindly showed me specimens of *kapustini* and discussed with me the interesting fact that *major* and *minor* are apparently not reproductively isolated, as had been widely believed. C. V.

firm the slight differences shown by the single specimen examined by Vaurie. Southern Annamese birds may be a little smaller than western Himalayan birds. My measurements of males are: *klossi* 56, 56, 57, *simlaensis* 56, 58, 59, but this alone would not warrant taxonomic recognition. I believe, however, that in a case such as this, in which two widely separated forms have come to resemble each other very closely, it is desirable to maintain separate subspecific names on slighter grounds than would otherwise be acceptable.