

American Museum Novitates

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

NUMBER 1685

AUGUST 11, 1954

Systematic Notes on Palearctic Birds. No. 9 Sylviinae: the Genus *Phylloscopus*

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INTRODUCTION AND ACKNOWLEDGMENTS

The following notes were made during a study of the genus *Phylloscopus* for a contemplated check list of the Palearctic region. I have followed the fine review of Ticehurst (1938, A systematic review of the genus *Phylloscopus*, London, British Museum, pp. i-viii, 1-193) but have in some cases reached different conclusions. The most important are that I believe that *P. lorenzii* and *P. nitidus* may be full species, that *P. ijimae* has probably reached specific level, and that *P. fuligiventer* and *P. tibetanus*, considered by Ticehurst to be separate species, are undoubtedly conspecific and appear also to be conspecific with *P. fuscatus*. The validity of some forms recognized by Ticehurst is questioned, the new forms described since his review are evaluated, and there are some notes on distribution. Since Ticehurst's review is constantly referred to no further bibliographical reference is made to it; all references made to Ticehurst in this paper concern then, unless otherwise noted, the 1938 review.

I would have been unable to reach some of my conclusions without the very free and kind cooperation extended to me by several individuals in lending me critical material from the collections under their care. I would like to express my gratitude to Dr. H. Friedmann and Mr. H. G. Deignan of the United States National Museum, Mr. J. C. Greenway, Jr., of the Museum of Comparative Zoölogy, Mr. J. D. Macdonald of the British Museum (Natural History), Dr. S. Dillon Ripley of the Peabody Museum, and Mr. R. M. de Schauensee of the Academy of

Natural Sciences of Philadelphia, and to Dr. D. Amadon and Dr. E. Mayr for advice and for reading the manuscript.

All workers with this difficult genus owe a debt to the memory of Claud B. Ticehurst. A large part of the material examined by me has been collected since his review, and it speaks highly of the quality of his work that the changes suggested in the present paper are minor ones or represent differences of opinion.

PHYLLOSCOPUS TROCHILUS

The following note concerns the occurrence of *Phylloscopus trochilus* in Iran, where its status seems to be purely that of a common and regular spring and fall transient.

According to Ticehurst, *P. t. acredula* (the only race of the species that I believe occurs in Iran) appears on the Persian Gulf on April 17, in western and southwestern Iran from the middle of April to the middle of May, in the southern Caspian districts and in the northeast [i.e., Khorasan] in the first half of May, and he cites an early record for neighboring Transcaspia on March 23, his only record for this region. His only fall record is October 13 in Persian Baluchistan. Paludan (1938, Jour. Ornith., vol. 86, p. 607) collected *acredula* in Luristan in the Zagros in the southwest on April 22 and 27 and May 6 and 16, some of the specimens having testes measuring 2 by 2 and 2 by 1.5.

The large series that I have examined suggest that *acredula* is a very common spring and fall transient in the western Zagros, in Luristan and Bakhtiari, and occurs regularly, but in smaller numbers, as far east as Shiraz in Fars and, occasionally, as far as Persian Baluchistan. The earliest specimens taken were collected on March 4 and 5 and large numbers from March 25 to May 21, some of the May specimens having testes that measured up to 4 by 3. Specimens were also collected on April 23 and May 17 in Khuzistan, and the earliest spring migrant on March 3 at Isfahan on the plateau. Fall migrants reach the Zagros by August 29 and pass through in large numbers up to the end of October (on the 22d). The migration does not seem to extend regularly quite so far east as Persian Baluchistan. I have examined but one specimen from this region which was collected at Bampur on August 13 [April 27] by Zarudny, and Ticehurst's fall record is also that of a single specimen. The species was not represented in collections available to me from Khorasan.

Zarudny (1911, Jour. Ornith., vol. 59, p. 224) and also Ticehurst state that *acredula* (called *eversmanni* by Zarudny) is a transient in this region, and Zarudny states also that it winters in Seistan, Mesopotamian

region [i.e., Khuzistan], and, rarely, in the Zagros. I am not aware of the basis on which Zarudny states that *acredula* winters in Iran. The migration normally carries to Africa, but occasional individuals may fail to complete it. Zarudny states also that nominate *trochilus* occurs as a transient in northwestern Iran and in the southern Caspian districts, but it is possible that he may have misidentified atypical specimens of *acredula*, or possibly *P. collybita*, as nominate *trochilus*, for it may be strongly questioned whether the latter, which occurs in Asia only as a possible straggler in the Near East, ever reaches Iran at all.

PHYLLOSCOPUS COLLYBITA

The following note concerns the validity of two races of *P. collybita* and the distribution of the species in Iran. Of the two races, one (*brehmii*, synonym *ibericus*) is accepted by Ticehurst but is, I believe, not sufficiently distinct morphologically from nominate *collybita* to warrant nomenclatural recognition; the other race (*fulvescens*) is not accepted by Ticehurst, but I consider, in agreement with the Russian authors, that it is a valid form.

Concerning the validity of *brehmii* Homeyer, 1870, type locality, Portugal, various authors have remarked that the populations breeding in the Iberian Peninsula and north Africa have a different song than the other populations of nominate *collybita*, the comparison being made usually with the population of Great Britain. Ticehurst and Whistler (1928, *Ibis*, p. 674) state that in life they also have paler legs than the population of Great Britain and show a number of slight differences, a second primary which is usually longer, a slightly brighter plumage, and a tendency towards a longer bill. They are of the opinion that these differences should be stressed by recognizing a separate race for which the name *brehmii* is available. According to Snow (1952, *Ibis*, p. 491) birds observed by him in north Africa resemble British birds "in all ways except for their song" which apparently is similar to that of the birds of the Iberian Peninsula.

Breeding specimens examined by me from Spain and north Africa in adult as well as in juvenal plumage show that the morphological differences described by Ticehurst and Whistler in 1928, by Ticehurst (1937, *Bull. Brit. Ornith. Club*, vol. 57, pp. 63-64) in the description of *ibericus*, and Ticehurst in his review are extremely slight and not constant. The difference in the color of the legs cannot be appreciated in skins, but it appears to be inconstant also. In nominate *collybita* from Great Britain the legs are said to be dark brown in life in the "Handbook of British birds" and apparently do not differ in color from those of adults collected

"at the nest" in southern Spain by Lynes, for Lynes, a very painstaking collector, has noted on the labels of these specimens that I have examined that their legs and feet were "dark umber brown." The only constant difference seems to be in the song, but I agree with Hartert and Steinbacher (1934, *Die Vögel der paläarktischen Fauna*, suppl. vol., p. 240) that, lacking sufficient morphological differences, this behavioral difference cannot be used for separation.

If, however, separation should be deemed to be desirable the correct name to be used is *brehmii*, not *ibericus* Ticehurst, 1937, for in my opinion the name *brehmii* cannot be assigned with certainty to wintering nominate *collybita* in the Iberian Peninsula as is done by Ticehurst. There is no proof that the specimen from Portugal of the three in the Brunswick Museum examined by Steinbacher for Ticehurst is really the type of *brehmii*. Homeyer did not appoint a type, and it is not stated what material from Portugal he had available. Furthermore it cannot be assumed that this specimen was not native to Portugal, for as stated above morphological discrimination between the various populations of nominate *collybita* and those of the Iberian Peninsula is uncertain.

In regard to *fulvescens* Ticehurst does not recognize this form on the ground that its characters (less gray above, more greenish than *tristis*) are not constant, but all the Russian authors as well as Johansen (1947, *Dansk Ornith. For. Tidsskr.*, vol. 41, pp. 209, 214) acknowledge its validity, and material that I have examined supports this view. I unfortunately have not examined specimens from the range of *tristis* which is stated to be east of the Yenisei by the Russian authors and Johansen, but I did examine a series from the range of *fulvescens* taken during the breeding season at Orenburg in the southern Urals and a very large series of winter visitors collected from Iran eastward to India. The specimens from Orenburg and all the specimens from Iran eastward to the region of Kabul in Afghanistan agree perfectly or virtually so and consistently show a greenish tinge on the upper parts, very faint on the back but well indicated on the rump and upper tail coverts, whereas specimens taken from Kabul eastward lack this tinge completely or in an occasional specimen show a very faint trace of it on the rump. This geographical segregation in the winter quarters suggests that the visitors were derived from distinct breeding populations and that *fulvescens* is a valid race.

This race, in my opinion, is the breeding form of northeastern Iran, being replaced farther west, from Gilan westward, by *abietinus*. In Iran the species breeds only in the north and had hitherto been reported as such only from Gilan (Stresemann, 1928, *Jour. Ornith.*, vol. 76, p. 373)

and the region east of Tehran [Paludan, 1940, in Jessen and Spärck (eds.), Danish scientific investigations in Iran, pt. 2, p. 44]. Stresemann, who identified his specimens from Gilan as the "gray variety" of *abietinus*, reported also that Bilkevitch recorded an immature specimen taken on July 4 at Ach-Imam, a locality I cannot find. Paludan collected only a single specimen, immature, taken on July 21 at Firuzkuh, the subspecific status of which is difficult to establish.

I am able to report a breeding series of seven specimens collected by Dr. Koelz considerably farther east in the middle of July near Gurgan at the southeastern corner of the Caspian, as well as a single specimen taken on August 4 at Kotaliyekchinar in northern Khorasan on the southern side of the Kopet Dag. This latter locality is northeast of Bujnurd and about 300 kilometers east of Gurgan. These specimens, though brighter as they have acquired most of the fresh fall plumage, agree very well with breeding *fulvescens* from Orenburg but definitely do not agree with *abietinus* examined from Scandinavia and Pskov in western Russia. Gurgan and Khorasan are, of course, cut off from the nearest breeding populations of *fulvescens* by the Caspian and the deserts of Transcaspia and Turkestan, but apparently an eastward cline in the reduction of the lipochromes runs in northern Iran, as it does in Russia and Siberia, from *abietinus* through *fulvescens* to *tristis*, and has resulted in populations which in eastern Iran are not separable from *fulvescens*.

No breeding *collybita* has hitherto been reported so far east in Iran, but I feel confident that the specimen from Khorasan was probably on its breeding grounds or near them, as it had not yet completed its post nuptial molt. This may or may not be supported by Shestoperov (1937, Aves, Keys to the Vertebrata of Turkomania, pt. 4, p. 244), in a publication which is not available to me but in which, according to the Zoological Record, he described birds from the Kopet Dag as *P. c. menzbieri*. I have no way of knowing if *menzbieri* is based on breeding birds, but at any rate this form will probably be found to be a synonym of *fulvescens*, because I find that birds from the Iranian side of the Kopet Dag and Gurgan are not separable from the latter.

These records from Gurgan and northern Khorasan and the possibility that *P. collybita* breeds throughout the Kopet Dag have an important bearing on the specific status of *P. neglectus* discussed below.

PHYLLOSCOPUS (COLLYBITA?) LORENZII

This interesting form and *P. collybita abietinus* overlap in the Caucasian and Transcaucasian regions and as a result used to be considered separate species. Recent authors, however, treat the two forms as con-

specific, *lorenzii* apparently replacing *abietinus* at higher altitudes during the breeding season. This treatment, which was first proposed by Stegmann (1934, Ornith. Monatsber., vol. 42, pp. 76-77) and is followed by Ticehurst, may be correct but is open to certain reservations.

These are that *abietinus* is found throughout the range of *lorenzii*, a very extensive region stretching more than 1000 kilometers from Azerbaijan to Maikop northwest of the Caucasus, by about half of that wide, from the region north of the Caucasus to Armenia. We are not dealing here with the overlapping ends of a ring of intergrading subspecies, as is the case of *Parus major* in Amurland and in *Phylloscopus trochiloides* in the western Sayan between the races *viridanus* and *plumbeitarsus*, but probably with two separate invasions. Of these, *lorenzii* is probably the older judging by its comparatively restricted range in contrast with that of the very widely ranging *P. collybita*, which has spread all the way from the upper Lena River in eastern Siberia to the western Himalayas, western Europe, north Africa, and the Canaries. Furthermore, as stated by Ticehurst, *lorenzii* and *abietinus* behave as separate species, and intermediate specimens are apparently unknown for "in the Caucasus every specimen is definitely either *abietinus* or *lorenzii*, the two forms being very distinct."

I have, however, examined some specimens which suggest that reproductive isolation has not been completely perfected. These are part of a series of 11 specimens collected from October 25 to November 25 in the regions of Ardebil, Tabriz, and Maraghe in Persian Azerbaijan. Of these, five are indistinguishable from *abietinus* from Scandinavia and western Russia, and two, from toptotypical *lorenzii*. The other four, though hardly distinguishable from *lorenzii* at first sight, show some slight signs of hybridization. These signs can be recognized, for *abietinus* is grayish olive above, has a yellowish eye ring, and is bright sulphur yellow on the bend of the wing, axillaries, and under wing coverts, whereas *lorenzii* which is a warm gray brown above lacks green pigments altogether, and its yellow pigments are reduced to a slight trace of pale yellow under and at the bend of the wing apparent only in specimens in fresh fall plumage. In the four specimens mentioned the gray brown of the upper parts is not quite so warm in shade as in toptotypical *lorenzii*, the lesser upper wing coverts are greenish or faintly tinged with greenish, one specimen has a yellowish eye ring, and in all four specimens the yellow pigments under and at the bend of the wing vary from being strongly developed as in *abietinus* to very slightly better developed than is normal in *lorenzii* in comparative plumage. *Phylloscopus c. abietinus* differs also from *lorenzii* by having a proportionately shorter tail. In

the four specimens, three of which are adult males, the proportions of the tail are about intermediate or similar to those of *abietinus*, being 74, 77, and 80 per cent of the length of the wing, whereas they are 82, 83, 84 in three male topotypes of *lorenzii* measured and 74 to 78 in five male *abietinus* from western Russia.

There is no way to determine whether these four specimens and the two typical *lorenzii* were local birds at the dates collected. They may have been, for *lorenzii* breeds not far away across the border in Armenia and Russian Azerbaijan, and this form, though it may wander after the breeding season, is known to be non-migratory, the only recorded exception (reported by Ticehurst) being that of a single specimen taken at Basra in Iraq on November 20.

The existence of an occasional specimen showing a few slight signs of hybridization is no proof, of course, that the two forms are conspecific. Furthermore, the fact that ecological preferences separate two closely related forms breeding in the same region argues that these forms may be separate species. It is a little difficult, however, to consider that *lorenzii* is a separate species, for it is certainly most closely related to *P. collybita* and is not easy to distinguish from the populations (*sindianus*) of this species now breeding in the Pamirs and western Hibalayas, these populations, in turn, being very similar to the populations (*tristis*) of *P. collybita* breeding east of the Yenisei.

PHYLLOSCOPUS NEGLECTUS

The specific status of this very diminutive brown and white form without a trace of green or yellow in its plumage is much disputed. Hartert, and Hartert and Steinbacher, in "Die Vögel der paläarktischen Fauna" and its supplement treated it as a separate species, with *lorenzii* as a subspecies, but this treatment is based on a superficial resemblance in coloration and appears to be incorrect. The Russian authors and Johansen (1947) treat *neglectus* as conspecific with *P. collybita*. Ticehurst keeps *neglectus* as a monotypic species, stating that his experience with the bird in life convinces him that it is not conspecific with *P. collybita*, but he adds that it is the geographical representative of this form and could, on this basis alone, be considered to be conspecific. Johansen, Ticehurst, and the Russian authors were not aware, however, that *P. neglectus* and *P. collybita* are sympatric over a wide region in north-eastern Iran. The evidence showing that the two forms are sympatric at the western end of the range of *P. neglectus* and the known distribution at the eastern end of its range are stated below.

A large series of *P. neglectus* that I have examined shows that at the

western end of its range it breeds throughout Khorasan including the Kopet Dagh and reaches the region of Gurgan at the eastern corner of the Caspian. From this last region I have examined a series of eight adults and one immature taken on the same dates (July 17-22) and at the same localities (Dimah and Kharimserai) as the series of breeding *P. collybita* reported above. The adults are in worn breeding plumage, and in some of them the post nuptial molt has begun. A molting specimen of *P. collybita* taken on August 4 in northern Khorasan and the probable occurrence of this form in the Kopet Dagh are discussed above.

In the eastern part of its range *P. neglectus* does not appear to be sympatric with *P. collybita* (race *sindianus*) in so far as is known, but future collecting may demonstrate an overlap. *Phylloscopus neglectus* breeds as far east as eastern Badakhshan and appears to breed in Tadzhikistan, *sindianus* breeding just to the east in the Pamirs and Gilgit. *Phylloscopus neglectus* has been reported as breeding in Ladak, i.e., well within the breeding range of *sindianus*, but these records have been shown to be unsatisfactory by Ticehurst. I have not examined *neglectus* as a breeder in Indian territories. Ticehurst seems to contradict himself in his statement that *neglectus* and *sindianus* are geographical representatives when he states (p. 58) that *sindianus* probably breeds in the region of Ghorband in northern Afghanistan, i.e., well within the breeding range of *neglectus*, but this statement is based on a sight record by Meinertzhagen (1938, Ibis, p. 676) which is incapable of proof for even in the hand the two have been confused.

PHYLLOSCOPUS SUBAFFINIS

The relationships of this form and *P. affinis* still require further study. The material that I have examined, including the specimens collected by Schäfer in Sikang (1939, Proc. Acad. Nat. Sci. Philadelphia, vol. 90, pp. 229-230), as well as specimens collected since then, has added nothing new to the present knowledge as summarized by Ticehurst. The two forms are virtually geographical representatives, but the breeding specimens available so far show that an overlap exists in the regions where the ranges of the two meet, i.e., from northern Yunnan eastward through southern and southeastern Sikang to northwestern Szechwan. However, since in contradiction to the situation in *fuscatus-weigoldi* (discussed below), there is no sign of any intergradation in this zone, it seems best to continue treating *affinis* and *subaffinis* as two separate species. For differences in their ecology, see Schäfer (1938, Jour. Ornith., vol. 86, Sonderheft, p. 245).

The status of the two forms has been further complicated by the recent

description of birds wintering in Nepal as a race of *subaffinis*, in a region which is more than 700 miles to the west of the nearest known wintering ground of nominate *subaffinis* in northeastern Burma. The new form is based on three specimens and was separated as *arcanus* by Ripley (1950, Proc. Biol. Soc. Washington, vol. 63, p. 105, type locality, Kailali District, western Nepal). I have been able to examine these specimens through the courtesy of Dr. Ripley and of the United States National Museum. They are more straw yellow than nominate *subaffinis* but much closer to this form than to *P. affinis*, and their bill is somewhat larger than in either of the other two forms. On the basis of these three specimens *arcanus* is a separable form, but its validity and status require further study.

PHYLLOSCOPUS FUSCATUS

This species, in my opinion, consists of four races: (1) nominate *fuscatus* Blyth, 1842, which ranges in Siberia from the Ob eastward through northern Mongolia to Anadyrland and the Sea of Okhotsk and reoccurs in a population with a very slightly longer wing ("*robustus*") in Kansu, neighboring northeastern Tsinghai east of Koko Nor, and northern Szechwan; (2) *weigoldi* Stresemann, 1924, which replaces nominate *fuscatus* west of Koko Nor and at higher altitudes in northern Szechwan and which ranges westward through Sikang; (3) *tibetanus* Ticehurst, 1937 (Bull. Brit. Ornith. Club, vol. 57, p. 109, Bimbi La, Tsari, southern Tibet), which is known so far only from southwestern Sikang; and (4) *fuligiventer* Hodgson, 1845, which according to Ludlow (1951, Ibis, p. 564) replaces *tibetanus* "in the alpine zone above conifer level in Bhutan," ranging to Sikkim and to perhaps Nepal.

Three of these forms (*weigoldi*, *tibetanus*, and *fuligiventer*) are rare in collections. Until the recent trips of Ludlow reported in 1944 (Ibis, pp. 198-200) and 1951, only four specimens of *tibetanus* existed in collections, and the breeding grounds of *fuligiventer* were unknown until reported by Ludlow in 1951. The relationships of these three forms to one another and to nominate *fuscatus* were heretofore the least well understood of all problems relating to the *Phylloscopi*, and all four forms have been considered to be separate species. The material collected recently by Ludlow shows conclusively that *tibetanus* and *fuligiventer* are conspecific, and I agree with Ticehurst that *weigoldi* and nominate *fuscatus* are conspecific, for the two forms are linked by intergrading specimens collected recently in good numbers by Ludlow. *Phylloscopus* f. *tibetanus* and *weigoldi* are strict geographical representatives, and I have examined specimens of *weigoldi* with characters tending towards

those of *tibetanus*. On the basis of the intergradation of characters and allopatric distribution during the breeding season, I believe that the four forms should be united under the species name *fuscatus*.

Because the relationships of these four forms have been considered to be obscure and three are so little known, a detailed discussion of their taxonomic characters, including distribution, is warranted.

The distribution of the four races during the breeding season is shown in figure 1, with the exception of that of the northern populations of nominate *fuscatus*. The records figured (see below) are those of specimens examined by me, with the addition of a few records from the literature which appear to be those of breeding birds. It should be remarked here that nominate *fuscatus* and *weigoldi* are migratory, the former very highly so, and, because both races are already migrating through Sikang by the end of the first week in September¹ and are still on their return flight at the end of May, that the records in figure 1 are those of birds collected in June, July, and August with the exceptions of a record of *weigoldi* from September 2 in Sikang and one of nominate *fuscatus* from May 20 in eastern Kansu where only this form occurs. The migratory movements of *tibetanus* and *fuligiventer* are very limited, being chiefly altitudinal.

It will be noticed that the four races replace one another geographically, with the possible exception of the region of Sungpan in northern Szechwan where *weigoldi* and nominate *fuscatus* both occur, and it was chiefly for this reason that they were considered to be separate species by Stresemann (1924, Abhandl. Ber. Mus. Dresden, vol. 16, no. 2, p. 16). In this region, however, *weigoldi* breeds at higher altitudes in a different habitat than nominate *fuscatus*. According to Schäfer (1939, Proc. Acad. Nat. Sci. Philadelphia, vol. 90, pp. 230-232) both forms (he was uncertain as to whether they are "distinct species or ecological races") occur "together in the southern and southeastern parts [of Sikang] along the border of the Hsifan mountains," but Schäfer has apparently never collected nominate *fuscatus* breeding within the range of *weigoldi*. All of his specimens that I have examined show that his *fuscatus* were collected within the range of *weigoldi* only from September 20 to October 27 in Sikang at a time when, as stated above, the migration is in full swing through this region.

The situation in Szechwan and Sikang has been discussed by Ticehurst. I agree with his conclusion that although "more research is needed

¹ Some individuals migrate before this date. I have examined an abnormally early fall migrant collected on July 25 in Yunnan.

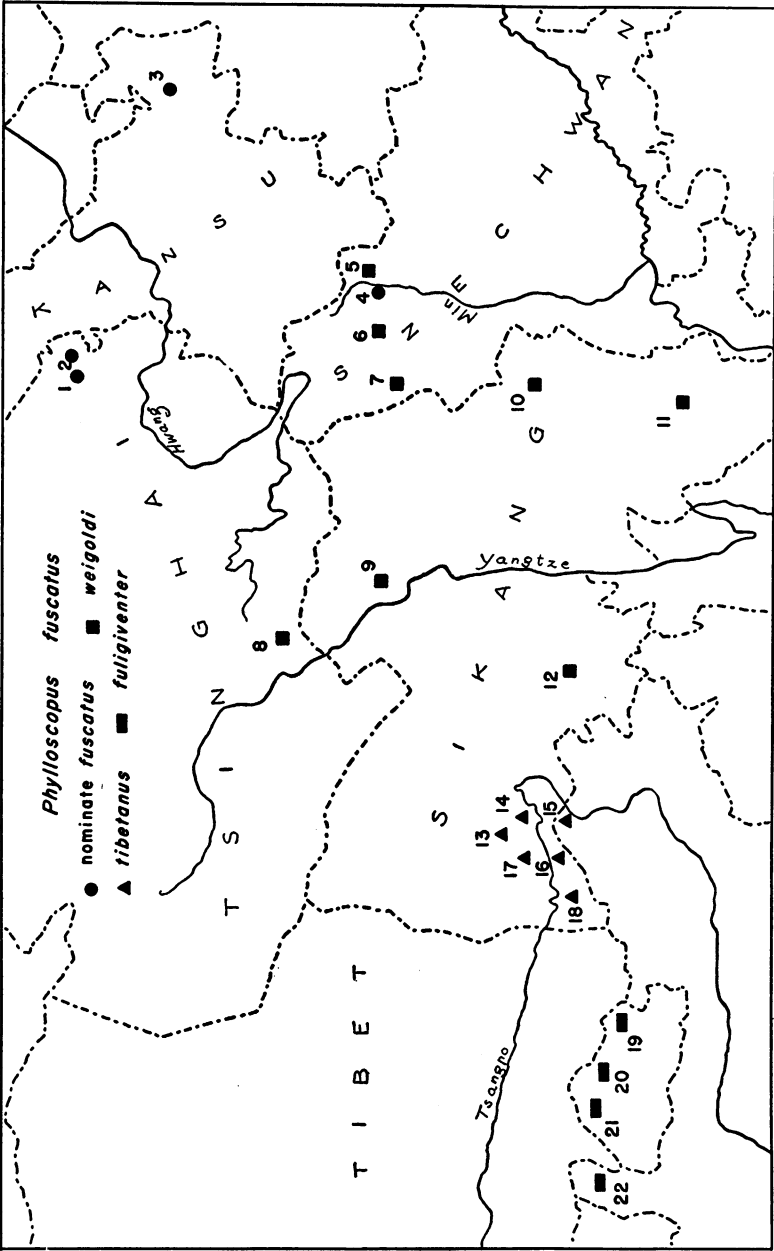


FIG. 1. Distribution of *Phylloscopus fuscatus* during breeding season from western China to eastern Himalayas.

on the ranges of *fuscatus* and *weigoldi* . . . [present evidence shows that] in Chwanben [i.e., Sikang], as in Szechwan, *weigoldi* is the Tibetan high alpine form which on the edge of its distribution meets with, and at somewhat lower elevations is then replaced by *fuscatus*."

The conspecificity of nominate *fuscatus* and *weigoldi* is strongly supported by many intermediate specimens running the full scale from almost-typical nominate *fuscatus* to almost-typical *weigoldi*. We are not dealing here with an occasional specimen showing a slight admixture of the characters of another form with which it may or may not be conspecific, as already discussed in the present paper in the case of *P. collybita* between the forms *lorenzii* and *abietinus*. The intermediate specimens mentioned by Ticehurst were part of a series of 15 specimens collected by Ludlow in September and October, 1933, 1934, and 1936, while they were on migration through southeastern Tibet and eastern Bhutan. I have examined 11 of these specimens, and, in addition, another intermediate taken by Ludlow on September 27, 1938, at Tsela Dzong in the Tsangpo Valley in southwestern Sikang and nine others collected also by Ludlow in southwestern Sikang in September and October, 1947. These nine specimens are part of the series of 11 specimens reported by Ludlow in 1951 but mistakenly identified by him, I find, as nominate *fuscatus*.

The localities and dates of the specimens recorded in figure 1 are given below. Records taken from the literature are indicated.

Nominate *fuscatus*

1. Hung-ho-siae, northeastern Tsinghai, June 13
2. Lau-hu-kou, northeastern Tsinghai, May 16 (also from the literature, May 12 to June 22, Stresemann *et al.*, 1937, Jour. Ornith., vol. 85, p. 533)
3. 45 miles northwest of Ninghsien, southeastern Kansu, May 20
4. Sungpan, northern Szechwan, June 2-3 (also from the literature, June 5 and 26, Stresemann, 1924)

Phylloscopus fuscatus weigoldi

5. Sueshan Pass, northern Szechwan, June 22
6. Merge, northwestern Szechwan, August 13
7. Datsang Pass (position approximate), northwestern Szechwan, August 20
8. Camp 79, 100 miles northeast of Jyekundo [=Yushu], southeastern Tsinghai, June 10
9. Camp 141, near Dzogchen Gomba, north central Sikang, September 2
10. Dschiesong¹ near Tatsienlu [=Kangting], eastern Sikang, June 24 (Stresemann, 1924)
11. Den-chiang-uin near Ningyuanfu [=Sichang], southeastern Sikang, August 10
12. Poda near Sangachu Dzong [=Sanga Chojong], south central Sikang, June 26 (Ludlow, 1944)

¹ Type locality of *weigoldi*.

Phylloscopus fuscatus tibetanus

13. Nambu La, southwestern Sikang, August 30
14. Sang La, southwestern Sikang, June 28
15. Nam La, southwestern Sikang, August 31
16. Langong Chu, southwestern Sikang, May 30–June 5 (Ludlow, 1944)
17. Mira La, southwestern Sikang, August 15
18. Bimbi La,¹ southwestern Sikang, June 9

Phylloscopus P. fuscatus fuligiventer

19. Kang La near Narim Thang, eastern Bhutan, August 8–24
20. Rinchen Chu Valley (position approximate), north central Bhutan, August 10
21. Mang de Chu (position approximate), north central Bhutan, August 25
22. Northern Sikkim, no locality, June

The four races differ only slightly in structure and to a no greater extent than might be expected between races of the same species with different migratory habits and ecology. The measurements of breeding males are given in table 1.

TABLE 1
MEASUREMENTS OF BREEDING ADULT MALES IN *Phylloscopus fuscatus*

Race	N	Wing ^a	Tail	Bill
<i>fuscatus</i>	13 ^b	61–66 (63.5)	48–53 (50.2)	12.5–14.5 (13.3)
<i>weigoldi</i>	5	59–64 (61.0)	45–52 (48.0)	13–14 (13.5)
<i>tibetanus</i>	5 ^c	54–59 (56.5)	44–48 (46.0)	13–14 (13.5)
<i>fuligiventer</i>	10	54–59 (57.5)	42–48 (45.0)	13–14.5 (13.6)

^a The first primary exceeds the primary coverts as follows: nominate *fuscatus* 9–13 (11.3), *weigoldi* 10–14 (12.0), *tibetanus* 11–14 (12.5), and *fuligiventer* 11–14 (12.6).

^b From Siberia and Mongolia.

^c Two males and three unsexed, apparently males.

It can be seen that *weigoldi* is about intermediate in size between nominate *fuscatus* on the one hand and *tibetanus* and *fuligiventer* on the other. The wing formula is also intermediate, the wing tip being slightly more pointed and the first primary shortest in nominate *fuscatus*. The wing formulas are generally as follows: nominate *fuscatus*, 3, 4, 5 subequal with 4 very slightly longest, 3=6 or 3 slightly > 6, 2=8 or 2=9; *weigoldi*, 4, 5, 6 subequal with 3=7 or 3 slightly > 7, 2=9 or 2=10; in *tibetanus* and *fuligiventer*, 3, 4, 5, 6 subequal, 2=10 or 2 < 10. The bill characters though very slight are interesting. In *weigoldi*, *tibetanus*, and *fuligiventer* the bill is more attenuated, proportionately longer, and in skins taken in recent years is distinctly blacker above and tipped with

¹ Type locality of *tibetanus*.

blackish or horn color below rather than being pale as in nominate *fuscatus*. The differences in wing length, wing formulas, and bill characters seem to be adaptive. The wing characters are correlated with migratory habits and extent of the migration and the bill characters with feeding habits, nominate *fuscatus* feeding closer to the ground and in a more open habitat than the other three races, which are birds of denser bushes. I can discern no differences in the bill feathering or its bristles, and all four races have the sixth primary slightly emarginated on the outer web.

The differences in coloration are more clear cut, with a progressive degree of increasing saturation running from nominate *fuscatus* to *fuligiventer*, *weigoldi* being intermediate between nominate *fuscatus* and *tibetanus*, and the latter intermediate between *weigoldi* and *fuligiventer*. Nominate *fuscatus* is palest, dull brown above with a slight tinge of olive in fresh plumage and creamy white below with fulvous flanks and under tail coverts; *weigoldi* is darker throughout, darker brown above and more tinged with gray below, being creamy only on the center of the belly and in some specimens slightly tinged with yellow below; *tibetanus* is still darker, sooty above, and much grayer and darker below, with the flanks and under tail coverts olive fuscous and with the center of the under parts invaded with dirty yellowish olive (curiously enough, as Ludlow remarks, 1951, the only four specimens of *tibetanus* available to Ticehurst for his revision, two of which I have examined, lack this yellow tinge); *fuligiventer* is as dark as *tibetanus* above but the gray of its under parts is always invaded by much and stronger dirty yellowish olive. The superciliary streak is most conspicuous in nominate *fuscatus*, whitish in front and fulvous behind the eye; it is more reduced in *weigoldi*, somewhat shorter and narrower and whitish throughout; it is still more reduced in *tibetanus* and grayish white; and it is very ill defined, almost obsolete, and dusky in *fuligiventer*. As Ludlow remarks, some individual specimens of *tibetanus* are hard to separate from *fuligiventer*, and, as I have mentioned, some specimens of *weigoldi*, tinged with yellowish below, begin to suggest the pigmentation in *tibetanus*.

All four races are similar in habits and have perhaps the same song and call. They are skulkers and not arboreal. Ludlow (1951) states that *tibetanus* and *fuligiventer* have "exactly the same alarm note and skulking habits and behave in exactly the same manner." Schäfer (1938, Jour. Ornith., vol. 86, Sonderheft, p. 246) states that the "song and habits" of nominate *fuscatus* and *weigoldi* are the same. No one has been able to make a direct comparison between *weigoldi* and *tibetanus*.

The material used in this study consists of 34 specimens of nominate

fuscatus taken during the breeding season on the breeding grounds, 16 specimens of *weigoldi*, about half of which were taken during the breeding season on the breeding grounds, 21 specimens intermediate between the two races, 14 specimens of *tibetanus*, and 26 of *fuligiventer*. In addition, close to 200 specimens of nominate *fuscatus* have been examined which were collected while on migration or in the winter quarters.

A number of additional forms have been separated from nominate *fuscatus*: *robustus* Stresemann, 1924, from northern Szechwan; *altaicus* Sushkin, 1925, from Russian Altai; and *mariae* Ripley (1951, Postilla, no. 6, p. 5, Manipur). The first two have been discussed and synonymized with nominate *fuscatus* by Ticehurst, and since my examination of topotypes of these two forms confirms his findings there is no need to discuss them. The validity of the third form is in my opinion not established with certainty, and I consider that *mariae* also is a synonym of nominate *fuscatus*.

The third form was based on four winter migrants in very fresh plumage taken recently by Ripley in Manipur, two specimens on October 19, 1950 (type and another specimen), and one each on October 17 and 18. These specimens, which Ripley states come closest in characters to nominate *fuscatus*, were separated nomenclaturally from this form on the basis of darker and richer coloration, a shorter bill, and possibly a slightly different wing formula.

This series of four specimens, which was kindly lent by Dr. Ripley, is darker above than any breeding population of nominate *fuscatus* that I have examined but less dark than *weigoldi* while matching the specimens mentioned above that are intermediate between nominate *fuscatus* and *weigoldi*. I have also examined a specimen in the collection of the United States National Museum which was identified as *mariae* by Ripley. This specimen, which was collected on October 1, 1924, in Szechwan, is, however, in such poor condition and so greasy that it is best eliminated, I believe, from a discussion of *mariae*.

The original series seems to be a composite one in that the type and paratype taken on October 19 seem to belong to a different population than the other two. The latter, taken on October 17 and 18, are less richly colored than the two specimens collected on October 19; they are more olive above and are ochraceous rather than cinnamon or pinkish buff on the sides of the head, breast, flanks, and under wing and under tail coverts; and their bill is less attenuated and very distinctly broader at the base. I cannot confirm a difference in the length of the bill between these four specimens and nominate *fuscatus*, and the wing formula cited by Ripley falls within the range of individual variation in this form.

Individual specimens which in one way or another differ from nominate *fuscatus* from the breeding range occur throughout the winter range. I have examined such birds from many parts of China from the Manchurian border south to Sikang and Yunnan, Indo-Chinese countries, Hainan, southern Tibet, India, and the Andamans. Their distribution follows no pattern. In coloration some are as dark above as the four specimens of *mariae* while others are pale but equally dark, richly colored, or ochraceous on the sides of the head, body, and under parts.

Specimens in which the buff on the sides of the head, breast, flanks, and under wing and under tail coverts is as deeply tinged with cinnamon or pinkish as in the type of *mariae* and the paratype collected at the same date, but in which the upper parts are paler (in one as pale as the palest specimens of nominate *fuscatus* collected during the breeding season in Siberia), have been examined, as follows: one specimen collected in April on Hainan, two specimens collected in May at Kiukiang and Hankow in the Yangtze Valley, and two specimens collected in late April at Chinwangtao on the border of Hopeh and Manchuria.

In short, I have not seen any specimens that quite match the type of *mariae* and the other bird taken at the same time. But other similar minor distinctions, as described above, may be detected in winter material, and it remains to be demonstrated that any of these have enough geographical and morphological reality to qualify as subspecies.

PHYLLOSCOPUS PROREGULUS

Meise has separated as *kansuensis* the population of this species breeding on the borders of eastern Tsinghai and Kansu (1933, Ornith. Monatsber., vol. 41, p. 82, type locality, Lau hu Kou, Sining region), but as Ticehurst remarks, *kansuensis* "is an intergradational form" between nominate *proregulus* and *chloronotus* and is apparently very poorly differentiated. For instance, Meise (1937, Jour. Ornith., vol. 85, p. 530) identifies as *kansuensis* specimens collected in this region by Rock which Ticehurst states he had found to be inseparable from *chloronotus*. I have examined only one specimen of *kansuensis*, a paratype which I cannot separate with certainty from nominate *proregulus*. I do not follow Ticehurst in accepting this form. Rather, I agree with Hartert and Steinbacher (1934, Die Vögel der paläarktischen Fauna, suppl. vol., p. 248) who state that they cannot confirm the characters of *kansuensis* which they consider to be synonymous with nominate *proregulus*.

PHYLLOSCOPUS MACULIPENNIS

In the Himalayan populations of *P. maculipennis* the population of Nepal is about intermediate in coloration between the populations (*virens*)

from Kumaon westward which are paler and those examined from Sikkim eastward (nominate *maculipennis*) which are darker. This was recognized by Ripley when he separated as *centralis* (1950, Proc. Biol. Soc. Washington, vol. 63, p. 106, type locality, Rekcha, Dailekh District, western Nepal) the populations of western and central Nepal, restricting the type locality of nominate *maculipennis*, the type of which was collected in Nepal according to Ticehurst, to eastern Nepal. I did not examine specimens from western Nepal, but judging by specimens examined from northern Punjab (the type locality of *virens*) eastward through Kangra and Tehri to Kumaon, from central Nepal, and from Sikkim eastward, the geographical variation is clinal and very gradual. The difference in coloration at both extremes of the cline, though clear, is in my opinion relatively slight, and the nomenclatural recognition of an intermediate is hardly warranted. I find that the difference between specimens from central Nepal (which Ripley apparently considers to be inseparable from the population of western Nepal) and Sikkim is scarcely appreciable, and I consider *centralis* to be synonymous with nominate *maculipennis*.

PHYLLOSCOPUS BOREALIS

This species varies geographically in coloration and size but has always presented a problem, for its coloration is greatly affected by the state of the plumage and rapid post-mortem changes. A study based on size, furthermore, with the use chiefly of specimens taken on migration or in the winter quarters is not authoritative, inasmuch as several forms with similar measurements apparently follow the same migration routes and share the same winter quarters. This species should be studied only with large series in strictly comparative plumage collected within recent years on the breeding grounds, but such material was not available until it was gathered by Portenko. His important revision (1938, Bull. Acad. Sci. U.R.S.S., ser. biol., pp. 1051-1056, with English summary) unfortunately was not available to Ticehurst (1938) and has been overlooked by all subsequent authors.

Portenko recognized five races. Two of these were proposed as new: *talovka* (type locality, headwaters of the Sertynya River, northern Urals) for the westernmost populations of the species, and *transbaicalicus* (type locality, Borzya, southeastern Transbaicalia) for the populations to the east of *talovka*; and there are three far eastern races: nominate *borealis* from northeastern Siberia and Alaska, *xanthodryas* from Kamchatka, the Commanders, and Japan, and a short-winged form breeding from Ussuriland to Amurland for which he revived the name *hylebata* Swinhoe, 1860, type locality, Amoy, Fukien.

Two other forms, which are more or less generally recognized, are not accepted by Portenko: *kennicotti* of Alaska, which he synonymizes with nominate *borealis*, and *examinandus*, which he synonymizes with *xanthodryas*. There can be little doubt that Portenko is quite correct in his action concerning *examinandus*, but he is not on sure ground as regards *kennicotti*. He states (Russian text) that he had only one specimen from Alaska and that this specimen (probably an old one) is not comparable as regards coloration with his specimens from Siberia. Portenko remarks that the published measurements of *kennicotti* are those of short-winged birds but that his specimen from Alaska, a male from the upper Nome River, has a wing of 68.2 and is therefore not smaller than male specimens from Siberia, the wing length of which he gives as 64.7–67.8.

Phylloscopus borealis kennicotti is an interesting form, for it is the only representative of the genus in the New World and as such has received a certain amount of attention in the literature. Among recent papers the most important is that of Parkes and Amadon (1948, Condor, pp. 86–87). These authors, who are interested chiefly in the winter quarters of this form, take its validity for granted on the basis of small size, but their material from Alaska, consisting of only two specimens which, I find, are first winter birds, is just as inadequate as Portenko's lone specimen. Ticehurst could not judge as to the validity of *kennicotti* and quotes a letter from Peters stating that it is probably valid but "rather unsatisfactory."

I have now been able through the courtesy of the United States National Museum to assemble a good series of 30 specimens from Alaska which was not available to previous authors. These specimens permit me to ascertain the correct measurements of this population and to assess its true coloration since half of the specimens were collected in 1950 and 1951 and include birds in worn as well as in very fresh body plumage. I find that the supposedly well-established smaller size of this form is not confirmed, but that *kennicotti* is a valid form on the basis of having a smaller bill than nominate *borealis* and a probably valid color difference.

Only 17 of the 30 specimens are fully adult. It may be remarked here that I find that most of the specimens, including the type and paratypes of *kennicotti*, from which the few and small published measurements were taken, are not adult. It is very easy to confuse adult with first winter birds, for they are extremely similar, but the latter must be excluded as they are invariably smaller. They can be detected if it is noted that their wing and tail feathers are fresh, whereas they are worn in

adults, the post nuptial molt in the latter apparently being partial and limited to the body plumage. First winter birds also usually show a more prominent and unworn wing bar. The molt and plumage sequence of this species are well described by Ticehurst under nominate *borealis* and his findings apply equally well to *kennicotti* in so far as I have been able to examine the juvenile, first winter, and adult plumages, in the latter before and after the post nuptial molt.

Because so few measurements of *kennicotti* have been published, my measurements of adult specimens taken in Alaska are listed individually.

Wing length: males, 66.5, 66.5, 67, 67.5, 68, 68.5, 68.5, 69; females, 63, 63, 63, 63.5, 64; unsexed, 62, 62, 63, 66; 17 adults, 62–69 (65.3), eight males, 66.5–69 (67.7).

Bill from skull: males, 13, 13, 13, 13, 13, 14, 14, 14.5; females, 12.8, 13, 13.5, 13.5; unsexed, 13, 13.5, 14, 14; 16 adults, 12.8–14.5 (13.4), eight males, 13–14.5 (13.5).

In eight adult males measured by me from the range of nominate *borealis* as defined by Portenko, from Anadyrland and the lower Lena, the wing length is 66, 67, 67, 67.5, 68, 68, 70, 70 (67.9), and the bill length is 14, 14, 14.2, 15, 15, 15, 15, 15.2 (14.6). Portenko gives the wing length of 16 males from the Chukotski Peninsula and Anadyrland as 64.7–67.8 (66.1); he gives no bill measurements. It can be seen that the wing length is identical or virtually so in the populations of northeastern Siberia and Alaska but that the bill is shorter in the latter. This difference, although slight when expressed in measurements, is perfectly appreciable to the eye, and the bill is also slightly broader at the base and slightly more attenuated in the Siberian specimens. Peters (*in* Ticehurst, 1938) had already noted the smaller bill in the birds of Alaska, and some of his specimens from Alaska (he measured a male with a wing of 67.1) were as large as specimens from Siberia.

All my specimens from Anadyrland and the lower Lena are old skins collected in 1901 and 1903, but if they are compared to old skins in comparative state of plumage from Alaska, the upper parts in the specimens from Siberia are grayer than in the skins from Alaska in which a tinge of olive still persists. Freshly molted birds from Alaska taken in 1950 and 1951 by Dr. Lawrence Irving and his party are olive green and rather bright above, and if Portenko is correct in stating that freshly molted birds from northeastern Siberia are olive-brown, one may conclude that *kennicotti* is separable from nominate *borealis* in coloration as well as on bill characters.

Parkes and Amadon in their paper referred all the males taken on migration and in the winter quarters to *kennicotti* if they had a wing

length of 65 mm. or shorter, but this criterion is invalidated by the above measurements. Further, although these short-winged migrants may have been first winter individuals of *kennicotti* or nominate *borealis*, the possibility that they may belong to the race *hylebata* or *transbaicalicus* cannot be excluded, for Portenko gives the measurements of these two forms as follows:

Phylloscopus b. hylebata: 17 males, 59.6–67.8 (65.6); five females, 60.6–64.7 (62.1).

Phylloscopus b. transbaicalicus: 40 males, 61.0–68.7 (65.8); 14 females, 59.3–65.1 (62.2).

The characters of the two new races proposed by Portenko and of the additional race for which he revived the name *hylebata* are as follows, according to Portenko: *P. b. talovka* in spring and fall plumage is more intense yellow green above and its eye streak yellower than in *transbaicalicus*, and it is brighter and purer green above and its eye streak paler than in nominate *borealis*. It is of about the same size as nominate *borealis*, smaller than *xanthodryas*, and larger than *transbaicalicus* and *hylebata*. *Phylloscopus b. transbaicalicus* differs from the other races by being more grayish, grayish green in fresh plumage, gray with a whitish eye streak in spring plumage. *Phylloscopus b. hylebata* is more yellow above than the other races, and its first primary projects more often beyond the primary coverts.

PHYLLOSCOPUS NITIDUS

Phylloscopus nitidus Blyth, 1843, which was retained by Ticehurst as a race of *trochiloides*, though not without strong reservations as to its true status, appears to me to be better treated as a separate species. It is now treated as conspecific with *P. trochiloides*, because it is supposed to be the geographical representative of *viridanus* Blyth, 1843, a form that intergrades very well into nominate *trochiloides* Sundevall, 1838, through *ludlowi* Whistler, 1931, in the northwestern Himalayas and perhaps because, as Ticehurst states, *nitidus* seems to resemble *viridanus* slightly more than it does any other *Phylloscopus*. However, presumptive resemblance is not proof of conspecificity, and present evidence as to distribution, though not conclusive, suggests that the two forms may be sympatric in southern Russian Turkestan and eastern Afghanistan.

Concerning distribution, *viridanus* breeds in Tadzhikistan and the western Pamirs, and its breeding range appears to extend into north-eastern Afghanistan westward to about the region of Kabul. In these regions, Ivanow (1940, Oiseaux de Tadjikistan, Moscow, pp. 215–216) collected both *nitidus* and *viridanus* on May 18 at Gissara in western

Tadzhikistan, and I have examined specimens of both taken on May 10 at Kulali in eastern Afghanistan. These specimens could have been migrants, but Ivanow reports that Zarudny found a pair of *nitidus* on May 27 in the Kuh i Tan (in Uzbekistan, northwest of Termez to the west of Tadzhikistan). Ticehurst gives a different version of this report. I cannot comment on its interpretation nor on the report of Meinertzhagen (1938, *Ibis*, p. 677) who states that he observed but did not collect paired specimens north of Kabul which may have been *nitidus*. But I can point out that *nitidus* breeds with certainty considerably farther east than hitherto suspected, for it breeds in Afghanistan in the Paropamisus, possibly as far east as longitude 68° E.

The coloration of the two forms is very distinct. In skins, as Ticehurst states, *nitidus* can hardly be confused with *viridanus* or in fact with any other *Phylloscopus*. Its plumage is very much brighter than that of *viridanus*, much greener above (despite the names), and much yellower below, while *viridanus* is very dull, dull grayish olive above and whitish faintly tinged with yellow below. Structurally, *nitidus* is a larger and more heavily built form with a coarser and stouter bill. This is not clearly shown by measurements but is very apparent in skins of the two forms prepared at the same time by the same collector. In size, five adult males of each taken at random measure: wing 64–66 (65), tail, 48–51 (50) in *nitidus*; 60–63 (62), 43–47 (45) in *viridanus*. Ticehurst gives the wing/tail ratio as being similar, 75 in *nitidus*, 76 in *viridanus*. The specimens that I have examined show clearly, however, that the tail is proportionately somewhat longer in *nitidus*. In the five specimens above, this ratio is 77 in *nitidus*, 72 in *viridanus*.

Intergrades between *viridanus* and nominate *trochiloides* are very well known (i.e., *ludlowi*), but intergrades between *viridanus* and *nitidus* are unknown. Ticehurst states that "the explanation of this may be that the ranges of the two are widely separated," but, as I show above, this no longer can be assumed.

PHYLLOSCOPUS TENELLIPES

Portenko has recently separated as *borealoides* the populations from the Kuriles and Japan from those of the mainland on the basis that these insular populations have a longer wing and tarsus and the upper parts purer green (1950, *Doklady Akad. Nauk*, vol. 70, p. 320, type locality, Kunashiri Island, southern Kuriles). His measurements of *borealoides* are: wing, in four males, 64.6–68.4 (66.5), in two females, 61.7, 62.0; as against 59.5–63.9 (61.3) and 54.7–58.3 (57.2) in nine males and eight females of *tenellipes*. The measurements that he gives for the tar-

sus are 18.7–20.9 (20.1) in males and 18.7, 19.2 in females of *borealoides*, as against 17.8–19.0 (18.4) and 17.8–18.8 (18.2) in, respectively, male and female *tenellipes*. Three males that I have measured from Japan have a wing of 62, 63, and 65 and a tarsus of 17.5, 18, 19, and two males from the mainland have 62, 64 and 19, 19, and I can see no color differences whatever. My comparative material may be insufficient, but it suggests that *borealoides* is not valid or is too insufficiently differentiated to warrant recognition.

PHYLLOSCOPUS OCCIPITALIS

In this species, Koelz has separated nomenclaturally specimens collected by him in eastern Afghanistan from others collected in the Himalayas, describing the former as *kail* (1939, Proc. Biol. Soc. Washington, vol. 52, p. 71, type locality, Kail, eastern Afghanistan). Koelz states that his specimens from Afghanistan are duller and grayer, less green above and on the edges of the wings than specimens from the Himalayas. His material which I have examined shows, however, that this diagnosis is based on very worn and faded specimens collected in June and July which were compared to specimens in fresher plumage. It is quite possible that future material in better plumage may show that, as in other Himalayan forms the range of which extends into Afghanistan, these populations stand at one extreme of a cline of decreasing saturation. Until such material is available and shows that the population of Afghanistan is sufficiently well differentiated to warrant nomenclatural séparation, I consider *kail* as being a synonym of nominate *occipitalis*.

PHYLLOSCOPUS IJIMAE

This little-known form from the Seven Islands of Izu was formerly considered to be conspecific with *P. occipitalis*, although it lacks the distinguishing coronal bands of this form. Austin and Kuroda (1953, Bull. Mus. Comp. Zoöl., vol. 109, p. 543) have recently stated that it is also “vastly different . . . in its song and its nesting habits” and that they regard it as being a separate species, a treatment which I follow. *Phylloscopus ijimae* has some similarity to *P. borealis* but is probably an insular derivative of *P. occipitalis coronatus*.

Until recently the migratory movements of this form were not well known, though it was known to occur in the Ryu Kyus on passage but its winter grounds were unknown. Austin and Kuroda state that it leaves the Seven Islands in October to return in late March. Phillips (1947, Auk, p. 127) cites several new records for the Ryu Kyus, and Gilliard (1950, Bull. Amer. Mus. Nat. Hist., vol. 94, p. 496) discovered its win-

ter grounds in the Philippines, where he collected it on December 15 on the Bataan Peninsula on Luzon. There is no proof, however, that it occurs also on Samar as stated by Gilliard, for the old specimen in the collection of the American Museum of Natural History from this island which Gilliard believes may be a specimen of *ijimae* seems upon re-examination to have been correctly identified originally as *P. olivaceus*.

PHYLLOSCOPUS REGULOIDES

In this species the populations extending from Kashmir to Szechwan have been divided into four races which, ranging from west to east, are *kashmiriensis* Ticehurst, 1933; nominate *reguloides* Blyth, 1842; *assamensis* Hartert, 1921; and *claudiae* La Touche, 1922. But it is sufficient, I think, to recognize only three races, for *assamensis* is a very poorly defined form which cannot be separated with certainty from nominate *reguloides*, as stated by Ticehurst, although he reluctantly recognized *assamensis*.

The geographical variation is as follows. There is a clinal increase in the green pigmentation of the upper parts running from west to east, and *kashmiriensis* intergrades with nominate *reguloides* in Garhwal and Kumaon, and the latter with *claudiae* in eastern Sikang from about longitude 100° E. to longitude 102° E. According to the specimens examined *P. r. claudiae* differs from the other two races by having the cheeks and coronal bands grayish, not yellowish or yellow, and by having the band of white on the inner webs of the outer rectrices very narrow and sharply delimited. In *kashmiriensis* and nominate *reguloides* the plumage, including the yellow pigments on the head, becomes increasingly saturated and the band of white on the rectrices broader as the populations range farther east, but in the populations at the eastern end of the range of nominate *reguloides* ("assamensis") these clinal changes are very poorly indicated and not constant. I cannot separate most specimens from the range of "assamensis" from nominate *reguloides* whether on the basis of depth in the yellow or green pigments or of width of the white band in the tail, and I find that the identification of individual specimens taken in the winter quarters or on migration is pure guesswork, as was recognized by Ticehurst.

