

American Museum Novitates

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

NUMBER 1946

JUNE 17, 1959

Systematic Notes on Palearctic Birds. No. 35 Picidae: The Genus *Dendrocopos* (Part 1)

BY CHARLES VAURIE

The following notes were made during a study of the Palearctic species of the genus *Dendrocopos* and are concerned with *D. major* and related species, and with *D. medius* and *D. leucotos*. The small species of this genus, the pygmy or "ladder-back" woodpeckers, form a distinct group and will be reviewed in a subsequent paper.

This study was based primarily on the collections of the American Museum of Natural History, but I have also examined the series in the British Museum (Natural History) and borrowed many specimens. My gratitude is due to Mr. J. D. Macdonald and his staff for the kind reception they extended to me in London and to the following individuals and institutions for the loan of specimens: British Museum (Natural History) (Mr. J. D. Macdonald), Chicago Natural History Museum (Dr. A. L. Rand and Mr. M. Traylor), Museum of Comparative Zoölogy (Mr. J. C. Greenway, Jr.), Museum of Zoology of the University of Michigan (Dr. R. W. Storer), Peabody Museum of Natural History of Yale University (Dr. S. Dillon Ripley), and Reichsmuseum Alexander Koenig in Bonn (Dr. G. Niethammer). I also had the pleasure of discussing some species with Dr. F. Salomonsen and Dr. E. Stresemann.

Dendrocopos major

The Great Spotted Woodpecker has been discussed in great detail by Voous in his study of the genus *Dendrocopos* (1947, *Limosa*, vol. 20, pp. 1-142). This paper, which is a rich source of information, is not a

formal taxonomic review (the emphasis being on evolutionary and distributional history), but Voous discusses and compares also all the subspecies of *D. major* and defines their ranges. He has recognized 30 subspecies, but I believe this number should be reduced to 22, and among the latter I have recognized *brevirostris* Reichenbach, which was synonymized with nominate *major* by Voous. Peters (1948, Checklist of the birds of the world, vol. 6, pp. 181–184) has divided *major* into 27 subspecies.

In the review that follows, I list the 22 races, with a brief diagnosis and a short statement of their range. The discussion is restricted chiefly to synonyms.

1. *Dendrocopos major major* Linnaeus, 1758, type locality, Sweden. This race is large, with a stout bill, and is rather pale below, the color varying from creamy white to buff and pale ocher. The bill is broad at the base, somewhat flattened above, with the lateral ridges extending from the nares halfway or more towards the tip.

The range is northern continental Europe south to East Prussia, northern Poland, and the northern Ukraine, but the eastern and southern limits cannot be defined with certainty, because nominate *major* grades into *brevirostris* in the east, *pinetorum* in the south, and *candidus* in the southeast.

The size variation of the European races, as shown by the wing length of 10 adult males of each, is as follows: nominate *major* from Sweden, 136–147 (140.7); *pinetorum* from central and southern Germany, 133–139 (136.2); *anglicus*, 126–132 (129.3); *italiae*, 124–132 (128.5); *harterti*, 131–139 (135.6); *hispanus*, 122–134 (127); *candidus* from Romania, 132–139 (135.9); and 130–137 (135) in *tenuirostris* from the northern Caucasus.

2. *Dendrocopos major pinetorum* C. L. Brehm, 1831, type locality, Renthendorf, Thuringia (see below), with the following synonyms: *alpestris* Reichenbach, 1854, type locality, Carinthia; *arduennus* Kleinschmidt, 1916, type locality, northern France; *praealpinus* von Burg, 1921, type locality restricted to Interlaken, Switzerland; and *paphlagoniae* Kummerlöwe and Niethammer (1935, Jour. Ornith., vol. 83, p. 45), type locality, northern Turkey. This race is smaller than nominate *major*, and the bill is less stout, being less broad at the base and more attenuated. The under parts are usually a little darker, less pure and more earthy, and as a rule the red of the lower abdomen and under tail coverts is slightly darker, more carmine.

The range of *pinetorum* is continental Europe, south of nominate *major*, eastward to Asia Minor, with the exceptions of the Iberian

Peninsula inhabited by *hispanus*, Italy inhabited by *italiae*, and Romania and southeastern Russia inhabited by *candidus*.

The populations from the European part of the range are not quite uniform, and their variation has been discussed by Voous, but this variation is insufficient, in my opinion, to warrant the recognition of more than one subspecies. Specimens examined by me show that in western Switzerland the population ("*praealpinus*") is slightly more brownish on the throat and breast than typical *pinetorum* from Germany, that in Carinthia ("*alpestris*") the birds have a thicker bill and paler under parts, and that in France and Belgium ("*arduennus*") the bill averages more slender and the under parts paler. However, all the differences are very slight and not constant.

Voous states that the birds of the Netherlands "agree with Belgian ones in all characters" and that the latter resemble those of France. He believes that these three populations (which he separates from *pinetorum* as *arduennus*) show a tendency towards *anglicus*. Specimens from the Netherlands were not available to me, but the slightly paler coloration of the specimens that I have seen from France and Belgium suggests a tendency towards *italiae* rather than *anglicus*. One cannot rely on the bill for differentiation, as it is similar in *italiae* and *anglicus*. However, whatever the trend, it is clear from the material I have examined that *arduennus*, *praealpinus*, and *alpestris* are very poorly differentiated and should not be recognized. Hartert, and Hartert and Steinbacher have considered them to be invalid in "Die Vögel der paläarktischen Fauna" and its supplements. The populations of Denmark and Hungary were discussed also by Voous, who states that the birds of Denmark show a slight tendency towards nominate *major*, and those of Hungary seem to belong to *candidus* rather than to *pinetorum*. I have not examined specimens from Denmark, but 14 that I have seen from Hungary are identical with *pinetorum*.

The population of Turkey shows a very slight tendency towards *tenuirostris* of the Caucasus, but virtually all the specimens that I have seen from Turkey are identical with *pinetorum*, and hence *paphlagoniae* cannot be recognized. The latter, according to Kummerlöwe and Niethammer, is very similar to *pinetorum* in coloration but differs from it by having a longer and more slender bill and a somewhat longer wing, the bill being even longer and more slender than in *poelzami* and *tenuirostris*. The measurements of nine males of "*paphlagoniae*" compared below to 10 males each of *pinetorum*, *poelzami*, and *tenuirostris* show that the birds of Turkey do not have a longer bill than *pinetorum*, or certainly not *poelzami*, and that the wing length

is not longer than in *pinetorum*. The 18 specimens I have examined from Turkey, more than two-thirds of which were collected in the north, show no difference in coloration. Only four have a bill that is somewhat more attenuated than normal in *pinetorum*, and the tendency towards *tenuirostris* is therefore extremely slight.

WING LENGTH: "*Paphlagoniae*," 130–139 (134.7); *pinetorum*, 133–139 (136.2).

BILL LENGTH: "*Paphlagoniae*," 27.5, 28, 28, 28.5, 29, 29, 30, 32; *pinetorum*, 27.5, 28, 29, 29, 29, 29, 30, 30, 32; *tenuirostris*, 27, 28, 28, 28, 28.5, 29, 29, 29, 30, 31; *poelzami*, 32, 32, 33, 33.5, 34, 34, 34.5, 34.5, 35, 35.

TYPE LOCALITY: Voous (p. 54) has restricted the type locality of *pinetorum* to Leipzig. However, Renthendorf, Thuringia, rather than Leipzig, appears to be the correct type locality. Brehm did not appoint a type, and Hartert (1918, *Novitates Zool.*, vol. 25, pp. 4–63), though he subsequently determined or selected a type for many of the forms described by Brehm, did not do so in the case of *pinetorum*, but the presumption that Renthendorf is the correct type locality is very strong, because all the specimens in the Brehm collection collected before 1831 and labeled *pinetorum* by Brehm are from Renthendorf.

3. *Dendrocopos major anglicus* Hartert, 1900, type locality, England. This race is similar to *pinetorum* but is a little smaller and has a more slender and attenuated bill. The coloration is slightly darker, the under parts tending to be more brownish, the cheeks more buffy, and the scapulars less pure white. It inhabits Great Britain north to Loch Ness.

4. *Dendrocopos major italiae* Stresemann, 1919, type locality, Italy; with *siciliae* Orlando (1956, *Riv. Italiana Ornit.*, vol. 26, p. 79), type locality, Sicily, as a synonym. This race is poorly differentiated from *anglicus*. It is similar to it in size and the shape of the bill but is a little paler below in fresh plumage and becomes distinctly paler, more creamy, in worn plumage. The range is Italy and Sicily, including the southern slopes and valleys of the Tessin in Switzerland. Orlando (*loc. cit.*) states that the birds of Sicily are intermediate in coloration between those of Italy and those of Sardinia and has named them *siciliae*. I have not examined specimens from Sicily, but some specimens that I have seen from Italy correspond to the description of the birds of Sicily given by Orlando. It seems to me that the birds of Sicily require further study.

5. *Dendrocopos major harterti* Arrigoni, 1902, type locality, Sardinia; with *parroti* Hartert, 1911, type locality, Corsica, as a synonym. This race, which inhabits Corsica and Sardinia, is darker in all plumages than the preceding races, more grayish brown below and on the ear

coverts, darker carmine on the lower abdomen and under tail coverts, and more heavily barred with black on the tail. The wing length is the same as in *pinetorum*, but the bill is more attenuated, similar in shape to that of *anglicus* and *italiae* but averaging a little bigger. The birds of Corsica show a tendency to have a longer bill than those of Sardinia, but measurements show a great deal of overlap, and the difference in average is much too slight to warrant the recognition of *parroti*.

BILL LENGTH IN MALES: Corsica, 28, 30, 30.5, 31, 31, 31, 31, 32, 32, 32, 32.5 (31); Sardinia, 27.5, 28, 29, 29, 29, 29.5, 30, 30, 31, 31.5 (29.5).

6. *Dendrocopos major hispanus* Schlüter, 1908, type locality, Spain. This race which inhabits the Iberian Peninsula is heavily pigmented and resembles *harterti* in general coloration but is more "warmly" colored below, more ochraceous, and, on an average, the ear coverts are a little paler, more whitish, and the tail is more broadly barred with black. Occasional specimens from the Peninsula show also a vaguely defined red crescent on the breast (or traces of it) not present in the preceding races or barely suggested in a rare specimen. The wing length averages shorter than in *harterti*.

7. *Dendrocopos major mauritanus* C. L. Brehm, 1885, type locality, Morocco; with *lynesi* Harrison (1944, Bull. Brit. Ornith. Club, vol. 64, p. 62), Moyen Atlas at 4800 feet, Morocco, as a synonym. This race inhabits Morocco south to the Sous Valley and is paler below than *hispanus*, whiter on the ear coverts, and paler carmine on the lower abdomen and coverts; the red crescent is better defined and present in more specimens. The birds of the Atlas Mountains average larger than those of the coastal lowlands and, as we might expect, show also a tendency to be more saturated in coloration, as the mountain forests receive a much greater rainfall than the arid or semi-arid coasts. The birds of the mountains have been called *lynesi* by Harrison, but the variation mentioned is normal for Morocco and it is misleading to resort to trinomial nomenclature to describe it. At any rate too many specimens are indistinguishable to warrant the recognition of *lynesi*. The males I have measured seem to show little overlap in measurements, but the overlap is very considerable in the case of the females.

WING LENGTH: Highlands, males, 125, 129, 130, 131, 131, 131, 134, 136; females, 123, 124, 126, 128, 128, 129, 129, 131, 133, 134. Coastal lowlands: males, 121, 123, 123, 123, 124, 124, 125, 125, 125, 125, 126, 126, 126+, 127, 128; females, 123, 124, 125, 125, 126, 126, 127, 128, 128, 130.

8. *Dendrocopos major numidus* Malherbe, 1843, type locality, Al-

geria. This race, which inhabits the cork oak forests of northern Algeria and Tunisia, differs very distinctly from *mauritanus* by having a broad band of black across the upper breast very conspicuously intermingled with red. The bill is distinctly longer, measuring 31.5–35.5 (33.2) in 12 males, as against 27–30 (28.5) in 12 of *mauritanus*.

9. *Dendrocopos major canariensis* König, 1889, type locality, Tenerife, Canaries. This race is restricted to the pine forest of Tenerife and resembles *harterti*, being dark and grayish brown below, but the under parts average darker and contrast more sharply with the color of the cheeks which are purer white than in *harterti*. It differs also by being whiter on the flanks, paler red on the lower abdomen and under tail coverts (more vermilion, less carmine), and by being more broadly barred with black on the tail.

10. *Dendrocopos major thanneri* le Roi, 1911, type locality, Gran Canaria, Canaries. This race, which is restricted to the pine forest of Gran Canaria, is similar to *canariensis* but very distinctly paler on the throat, breast, and abdomen. It is paler below and the white area on the flanks is much more extensive than in *harterti*.

11. *Dendrocopos major candidus* Stresemann, 1919, type locality, Romania, with *artobolevskii* Charlemagne (1934, Jour. Cycle Biol.-Zool. Kiev, no. 4, p. 26), type locality, Ukraine in autumn and winter, as a synonym. This race approaches nominate *major* in the pale coloration of the under parts, but these average a little paler in fresh plumage and become purer white in worn plumage. It is smaller than nominate *major* and has a distinctly more slender, narrower, and more attenuated bill tapering to a sharp tip. It is similar to *pinetorum* in size but is paler below in all plumages and has a more attenuated bill. It is larger and paler below than *italiae*.

The range of *candidus* seems to extend from Romania eastward through the Ukraine to the Don and the right bank of the Volga south of Saratov. I have followed Gladkov (1951, Birds of the Soviet Union, vol. 1, pp. 574–585) and also Dementiev (1934, *Alauda*, vol. 6, pp. 428–451) in extending the range of *candidus* to southern Russia, though Dementiev warned that the birds of Russia might not be identical with *candidus* and hence did not use a trinomial in discussing them. He stated that the birds in the region of the lower Volga south of Saratov “ont beaucoup de commun avec la forme de Roumanie *D. m. candidus* . . . dans leur coloration comme en dimensions,” while those from the region of Saratov itself “présentent plutôt un type intermédiaire approchant de *major*.” It seems to me from the account given by Dementiev that the birds found south of Saratov must be very similar to

candidus, if not identical, and Gladkov (*loc. cit.*) has called them *candidus*. The Rothschild Collection contains seven specimens collected in "southern Russia" in some unknown year in February and March which are identical with a series from Romania. I suspect from other specimens in the Rothschild Collection with similar labels, but with more data, that these specimens were probably collected in the region of Sarepta near Stalingrad.

The form *artobolevskii* was probably described too late to be discussed by Dementiev and is not mentioned by Gladkov. Peters (*loc. cit.*) has placed this name with a query in the synonymy of *candidus* where it seems best retained. Judging by the comment of Peters, *artobolevskii* probably represents visitors to the Ukraine from a population intermediate in bill characters between nominate *major* and *candidus*.

12. *Dendrocopos major tenuirostris* Buturlin, 1906, type locality, western Transcaucasia; with *kurae* Laubmann, 1915, type locality, eastern Transcaucasia, as a synonym. This race inhabits the Crimea, the Caucasus, and Transcaucasia, grading into *poelzami* in eastern Transcaucasia. It resembles *candidus* but is darker below, more ochraceous, in all plumages and is a little more heavily barred with black on the tail. The bill is similar in shape in the two races but averages shorter in *tenuirostris*, measuring 27–31 (28.8) in 10 males, as against 29–32 (30.4) in 10 of *candidus*. This diagnosis is based on five specimens from the Crimea and a series of 20 from the northern Caucasus, one from Nalchik, five from Pyatigorsk, and 14 from Vladikavkaz. The specimens from the Crimea are identical with those of the Caucasus. I have not seen birds from Transcaucasia but, according to Dementiev (*loc. cit.*), they are somewhat darker than those of the northern Caucasus, and some individuals from eastern Transcaucasia are intermediate between *tenuirostris* and *poelzami*. These intermediates have been named *kurae*, a name that has been synonymized with *tenuirostris* by Dementiev.

13. *Dendrocopos major poelzami* Bogdanov, 1879, type locality, Lenkoran, Talych. This race inhabits the southern Caspian region from Talych eastward to Gurgan and has been reported also from neighboring southwestern Transcaspia. It is very well differentiated from all the other races of *major* discussed so far, being smaller, darker below, smoky brown in coloration, and having a longer bill that is most sharply attenuated. Ten males have a wing length of 120–133 (125.4) and a bill length of 32–35 (33.8). The bill is longer in actual measurement and proportionately than in the other races; its length is 27 per cent of the length of the wing. *Numidus* of Algeria and Tunisia is the only

other race in which the measurements and proportions of the bill are about similar to those of *poelzami*. The bill averages 33.2 mm. in length and is 25.5 per cent of the length of the wing in *numidus*.

14. *Dendrocopos major brevirostris* Reichenbach, 1854, type locality, Irtysh River, Siberia. This race replaces nominate *major* in Siberia and differs from it by being paler in all plumages. The specimens of *brevirostris* that I have seen, which were nearly all collected from the Yenisei eastward to Yakutia and Amurland, are very pale creamy white on the under parts, cheeks, and scapulars, these areas becoming pure white or virtually so in specimens collected in November and December. The red of the lower abdomen and under tail coverts averages also slightly paler and brighter, and the wing somewhat longer, than in nominate *major*, measuring 141–149 (143) in 12 males as against 136–147 (140.7) in 10 topotypical males of nominate *major*.

The validity of *brevirostris* has been questioned. It is considered a synonym of nominate *major* by Gladkov and rejected by Voous, who states that he can detect "no taxonomic difference," and, further, that "no Siberian and N. European specimens can be distinguished as being *major* or *brevirostris*, without making use of the indications on the label." However, Dementiev (*loc. cit.*) believes *brevirostris* is valid and has given a good description of it, and it has also been defended by Johansen (1935, Jour. Ornith., vol. 96, pp. 388–389). I quite agree with Dementiev and Johansen, as I can distinguish easily all but one of my 18 specimens of *brevirostris* from a series of nominate *major*.

The variation is probably clinal in Siberia, as Johansen and Dementiev mention that its populations become progressively whiter as they range farther east, those from the western part of western Siberia, according to Johansen, being intermediate in coloration between *brevirostris* and nominate *major*.

?15. *Dendrocopos major tianshanicus* Buturlin, 1910, type locality, Semirechia near Djarkent. The correct status of this form is uncertain. Gladkov (*loc. cit.*), and Dementiev (*loc. cit.*) have treated *tianshanicus* as a valid subspecies of *major*, but Gladkov adds that its validity is doubtful, while Stegmann (1935, Ornith. Monatsber., vol. 43, p. 17, footnote) goes further and states that *tianshanicus* is invalid and a synonym of *brevirostris*. The specimens of *tianshanicus* that I have seen suggest that this form probably represents hybrids between *D. major* and *D. leucopterus*.

Dementiev states that *tianshanicus* differs from *brevirostris* by having a weaker bill and by being a little whiter on the wing, and perhaps also by being whiter below. The bill is intermediate in shape, more

slender than in *brevirostris* but less so than in *leucopterus*. He remarks "*Cette forme tout en étant plus proche des pics nordiques, est évidemment intermédiaire entre brevirostris et leucopterus.*"

The characters ascribed to *tianshanicus* are not very clear cut and are not well confirmed by five specimens that I have examined. Four of these were collected by Severtzov, one at some unspecified locality in Semirechia, one on the Naryn River, and the other two at "Dshirgalan" in the Tian Shan. The fifth, collected by Ludlow at Mointa on the Tekkes, was identified as *D. leucopterus leptorhynchus* by Ludlow and Kinnear (1933, Ibis, p. 684), but this specimen appears to be *tianshanicus*. It is a female with a wing length of 137 and is too big for *leucopterus*, 23 females of which measure 120–129 (125); its wing length is more similar to that of the specimens of *tianshanicus* collected by Severtzov, three of which are females and measure 138, 140, 142. The white spots on the wing of the female from Mointa are also not quite large enough for *leucopterus*, but the bill is slender and similar in shape to that of the latter. Among the four specimens collected by Severtzov, one is similar to the female from Mointa in coloration, but its bill is less slender; one is not distinguishable from *brevirostris* in any respect; and the other two differ from the latter only by having a more slender bill, though the difference is very slight in one of these two specimens.

The individual variation exhibited by these five specimens suggests that *tianshanicus* is probably a hybrid form. *Tianshanicus* certainly requires more study, but it seems best to retain it because of its bearing on the problem of whether or not *major* and *leucopterus* are separate species. This problem is briefly discussed below.

16. *Dendrocopos major kamtschaticus* Dybowski, 1883, type locality, Kamchatka. This race inhabits Kamchatka, the northern gulf of the Sea of Okhotsk south to at least Gizhiga, and is said to be occasional in Anadyrland. It differs from *brevirostris* and all the other races of the nominate *major* group by being much whiter on the wings and tail. The white spots on the primaries and secondaries are larger, the inner primaries are well tipped with white, and the black bars on the outer tail feathers are reduced to a few small spots or have disappeared altogether. The wing is shorter than in *brevirostris* or nominate *major*, but the bill is longer and much more attenuated, the wing of five males measuring 131–142 (137.5) and the bill in three, 33, 34, 36, against a range of 27–31 in males of *brevirostris* and nominate *major*.

This race combines to a curious extent the color characters of the races of the nominate *major* group together with those of the races of

the *cabanisi* group. The latter differs from the nominate *major* group by having less conspicuous white shoulder patches (the scapulars being black instead of white as in the nominate *major* group and the white area more reduced on the upper wing coverts), but its races, as a rule, have larger white spots or are more abundantly spotted with white on the inner webs of the secondaries. In *kamtschaticus*, the white shoulder patch is most conspicuous and represents the extreme development of this character. *Kamtschaticus* is isolated from the other two groups and has characters of its own (the white tail), but the two groups are connected by intermediate populations and *japonicus* which represents a true connecting link.

17. *Dendrocopos major japonicus* Seebohm, 1883, type locality, Hokkaido, with the following synonyms: *tscherskii* Buturlin, 1910, type locality, southern Ussuriland; and *hondoensis* Kuroda, 1921, type locality, Hondo. This race inhabits Sakhalin, Ussuriland, the greater part of Manchuria, Korea, southern Kuriles, Hokkaido, Hondo, and Tsushima and is intermediate between the races of the nominate *major* and those of the *cabanisi* group. The white shoulder patch is less conspicuous than in *kamtschaticus* or *brevirostris*, as the base of the scapulars is black to a varying extent, but the white spots on the inner webs of the secondaries are larger. The tail is conspicuously barred with black, and the under parts are darker, varying from very pale buff to pale ocher.

The populations (*tscherskii*) of Ussuriland and Manchuria are the palest, while those (*hondoensis*) of Hondo and southern Korea are darkest, but the differences are slight, and *tscherskii* on the one hand, and *hondoensis* on the other, cannot be separated constantly from the intermediate population (*japonicus*) of Hokkaido. The variation is clinal and is the same on the continent as in Japan. In Korea and Japan, "The northern and southern populations of the two countries are inseparable," according to Austin (1953, Bull. Mus. Comp. Zool., vol. 109, p. 490). It seems best therefore to recognize only one subspecies. I have not seen specimens from Sakhalin or southern Manchuria. The birds of Sakhalin are *japonicus*, according to Gizenko (1955, Birds of Sakhalin, Moscow, Akademia Nauk, p. 197), while those of southern Manchuria were identified as *cabanisi* by Meise (1934, Abhandl. Ber. Mus. Dresden, vol. 18, no. 2, p. 52).

The size variation of the eastern races, as shown by the wing length of 10 adult males of each, follows: *japonicus* from Hokkaido, 131–137 (133.7); *cabanisi* from Shantung, 132–139 (134.3); *beicki* from the Tsinling Range in southern Shensi, 134–143 (138.5); *beicki* from "Kansu,"

132–141 (137.3) in 12 males measured by Meise (1938, Jour. Ornith., vol. 86, p. 174); *stresemanni* from Yunnan and northern Burma, 129–137 (134); *mandarinus* from Fukien, 129–136 (133.5); *hainanus*, 122–131 (125).

18. *Dendrocopos major cabanisi* Malherbe, 1854, type locality restricted to Shantung. This race differs from *japonicus* by being darker, more ochraceous, below and on the cheeks, but paler, more rose than carmine, on the lower abdomen and under tail coverts. It inhabits northern China from southern Manchuria south to Shantung, Shansi, Honan, northern Anhwei, and northern Kiangsu, intergrading with *beicki* in the west, *mandarinus* in the south, and probably *japonicus* in the north.

19. *Dendrocopos major beicki* Stresemann, 1927, type locality, "Kansu" but equals northeastern Tsinghai. This race differs from *cabanisi* by being darker below and on the cheeks, more heavily barred with black on the tail, and less white on the wing, the white spots being reduced in size and numbers. It ranges from Shensi westward through Kansu to eastern Tsinghai.

Greenway (1947, Proc. New England Zool. Club, vol. 24, pp. 91–100), who has reviewed the Chinese races, has referred the population of the Tsinling Range in southern Shensi to *stresemanni* after examining the long series in the Rothschild Collection. However, this series of 29 specimens is much more similar in every character to three topotypes of *beicki*. In fact, about half of the specimens from Shensi are identical with the specimens of *beicki*, while the rest differ only slightly, though three or four birds are darker and show a tendency towards *stresemanni*. I believe, therefore, that the populations of Shensi should be called *beicki* rather than *stresemanni*. With this exception, my findings agree with those of Greenway. My specimens of *beicki* were collected by Beick himself.

20. *Dendrocopos major stresemanni* Rensch, 1924, type locality, border of Sikang and extreme northwestern Yunnan. This race differs from *beicki* by being distinctly darker on the under parts and cheeks, almost chocolate brown in fresh plumage. The white spots on the wing average smaller and the primaries are not tipped with white, or the white tips when present are much smaller. *Stresemanni* ranges from the mountains of western Szechwan westward to central Sikang, south to Yunnan and Burma, perhaps also to northern Kweichow. According to Stuart Baker (1927, Fauna of British India, vol. 4, pp. 34–35), *stresemanni* breeds also in the hills of Assam south of the Brahmaputra,

but I have not seen specimens from there, nor has Greenway. Peters (*loc. cit.*) has omitted Assam from the range of *stresemanni*.

21. *Dendrocopos major mandarinus* Malherbe, 1857, type locality, near Canton, Kwangtung. This race, which inhabits southern China from the Yangtze Valley south to Tonkin, northern Laos, and neighboring Southern Shan States, is darker below than *cabanisi*, more heavily barred with black on the tail, and less white on the shoulders and on the wing, the white spots being distinctly smaller. It is less dark below than *stresemanni* and resembles *beicki* in the coloration of the under parts, but the white area on the shoulders and the white spots on the wing are smaller. The population of the Yangtze Valley is intermediate between *cabanisi* and *mandarinus* but on an average is more similar to the latter in all characters.

22. *Dendrocopos major hainanus* Hartert and Hesse, 1911, type locality, Hainan. This race is restricted to Hainan Island. It is similar to *mandarinus* in coloration but is smaller (see above).

Dendrocopos major AND *Dendrocopos leucopterus*

The Great Spotted Woodpecker (*D. major*) and the White-winged Spotted Woodpecker (*D. leucopterus*) differ very clearly from each other morphologically, and their breeding ranges overlap in the Dzungarian Ala Tau and the Tian Shan. Virtually all authors consider that they are separate species, and I share this opinion. Nevertheless, the relationships of these two birds present a difficult taxonomic problem, and Dementiev (*loc. cit.*) and Stegmann (1935, *Ornith. Monatsber.*, vol. 43, pp. 15-20) believe they are conspecific.

Dementiev and Stegmann state that *leucopterus* and *major* are not truly sympatric, because they replace each other ecologically in the zone of overlap, *major* inhabiting coniferous forests while *leucopterus* inhabits deciduous forests. *Dendrocopos leucopterus*, according to Stegmann, frequents screens of deciduous trees, especially poplars which grow along the streams in the valleys, and is a lowland form, whereas *major* is a montane form. However, *leucopterus* probably ascends as high as the distribution of deciduous trees permits. I have examined specimens collected at 3700 feet in the Tian Shan, 3500 feet in the Bodgo Ola Range in Dzungaria, at localities in northeastern Afghanistan between about 5000 and 6000 feet, and at a little over 6000 in the Kun Lun (Sanju Pass). It is probable that the two birds occupy separate but adjacent habitats.

The morphological differences are sharp. *Leucopterus* is distinctly smaller than the race (*brevirostris*) of *major* which it overlaps or with

which it comes into contact, and has a much weaker and more slender bill, only about half of the width of that of *brevirostris*. It is much whiter in the adult or juvenal plumage than any race of *major*. Thirty-seven adult males of *leucopterus* that I have measured have a wing length of 122–123 (128), as against 141–149 (143) in 13 of *brevirostris*. Some races of *major* (*kamtschaticus*, *japonicus*, *poelzami*, and *numidus*) have a slender bill, some (*kamtschaticus*, *japonicus*, and *cabanisi*) have large white spots in the wing, and some (*brevirostris* and *kamtschaticus*) become white below. However, the bill is never so slender, the white spots never are so large, and the plumage never is so pure white, as in *leucopterus*. In the latter, the red pigment on the under parts of the adult ascends higher than in *major*, reaching the lower or central part of the breast. In the juvenal plumage, the under parts are not streaked or spotted, and the female is black on the crown, whereas in *major* this plumage is streaked or spotted and the crown is red in both sexes. The wing tip of *leucopterus* is also much more rounded than that of nominate *major* or *brevirostris*.

The sharp differences in ecology and morphology suggest that *leucopterus* is a separate species, though apparently it is not perfectly isolated reproductively from *major*. Stegmann mentions that he has examined one hybrid specimen. Voous may have examined another, and, as stated above, I believe that *tianshanicus* represents hybrids rather than a true connecting form between *major* and *leucopterus*. However, the existence of hybrids does not necessarily invalidate the belief that *leucopterus* had probably reached species level before part of its range was invaded by *major*. In support of this belief, I may cite that a similar situation exists in southeastern Europe between *D. syriacus* and *major*. In this case, *syriacus* is the recent invader, but it behaves as a separate species and is acknowledged to be one by all recent authors, though it occasionally interbreeds with *major*.

Dendrocopos leucopterus

The White-winged Spotted Woodpecker varies geographically, but I agree with Dementiev (*loc. cit.*) that it is best not to recognize any subspecies. The geographical variation involves chiefly the relative size and numbers of the white and black markings on the wing, the birds that inhabit the mountains and foothills of Turkestan being less white on an average, as stated by Dementiev, than those that inhabit the lowlands to the east and west of the mountains. However, the individual variation is very great, and so many populations are intermediate that Dementiev concluded it was more constructive to treat *leucopterus* as

monotypic. I agree that the use of trinomials would serve only to obscure the geographical trend in the variation, and Kinnear (1933, in Ludlow and Kinnear, *Ibis*, pp. 684–685) has also expressed doubts concerning the validity of subspecies.

The type locality of *leucopterus* Salvadori, 1870, was “central Asia,” which was restricted to Yarkand by Buturlin in 1908, according to Hartert (1912, *Die Vögel der paläarktischen Fauna*, p. 908). I consider the following to be its synonyms: *leptorhynchus* Severtzov, 1875, type locality, Tashkent; *albipennis* Buturlin, 1908, type locality, Tedjen; *korejevi* Zarudny, 1923, type locality, Kuldja; *bucharensis* Zarudny, 1923, type locality, eastern Bukhara; *jaxartensis* Zarudny, 1923, type locality, lower Syr Darya; and *spangenbergi* Gladkov (1951, *Ptitsy Sovetskogo Soiuza*, vol. 1, p. 588), type locality, Chatkal Tau.

Dementiev's study was based on at least 36 specimens; mine on about 90 from the collections of the British Museum and the American Museum of Natural History. Some specimens, topotypes when available, are illustrated in figure 1. This figure shows the extreme degree of individual variation. Birds from the western lowlands are shown from Tedjen (“*albipennis*”), and Kzyl Orda on the lower Syr Darya (“*jaxartensis*”), and from the eastern lowlands from Yarkand (typical *leucopterus*), Maralbashi east of Yarkand, and Lop Nor. Notice that specimens from the opposite extremes of the range, Tedjen and Lop Nor, are very white. Dementiev stated that his specimens from these two extremes seemed identical. Birds from the foothills or mountains are shown from Samarkand (“*bucharensis*”), Tashkent (“*leptorhynchus*”), Alexander Range, northeastern Afghanistan, Djarkent, Kuldja (“*korejevi*”), and the Bogdo Ola Range.

It seems impossible to recognize the four races (*albipennis*, *jaxartensis*, *leptorhynchus*, and *korejevi*) recognized by Peters (*loc. cit.*). Among the four specimens illustrated from Yarkand (topotypical *leucopterus*) and Maralbashi in the same region, some are about as white as the specimens from Tedjen (“*albipennis*”) while some are about as dark as the specimens from Tashkent (“*leptorhynchus*”). The populations of Tedjen and Tashkent represent, respectively, the whitest and darkest populations that have received a name.

Voous (*loc. cit.*) believes “that at all events a lighter western and a darker eastern form” are worthy of recognition, the western form being also slightly smaller, but, as shown by Dementiev and the present study, this statement is a misconception of the geographical variation. No separation seems to be possible on the basis of measurements, as in-

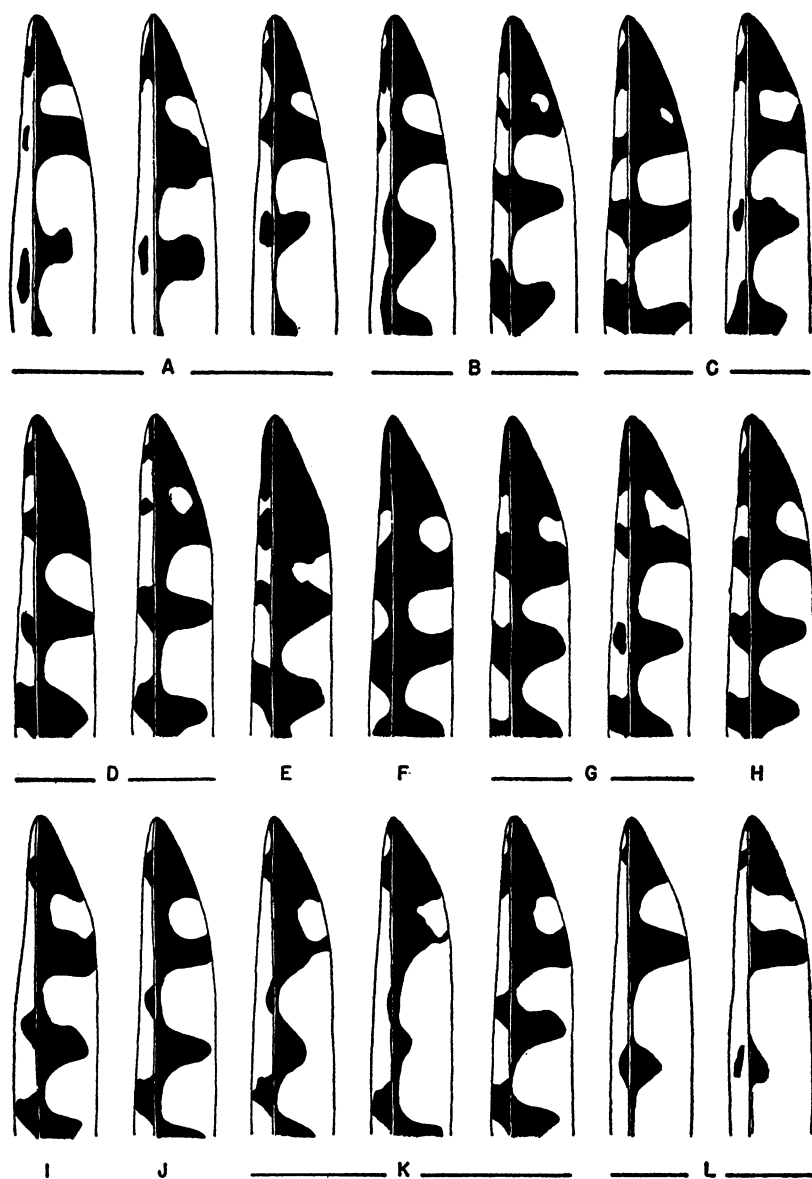


FIG. 1. Variation in the color of the wing feathers in *Dendrocopos leucop-terus*. The feather illustrated is the sixth primary. Key to localities: A, Tedjen; B, Kzyl Orda; C, Samarkand; D, Tashkent; E, Alexander Range; F, north-eastern Afghanistan; G, Djarkent; H, Kuldja, I, Maralbashi; J, Bogdo Ola; K, Yarkand; L, Lop Nor.

dividual measurements overlap. The wing length of adult males measures as follows:

WESTERN LOWLANDS: Tedjen, 122, 125, 125; lower Syr Darya, 126, 126, 126, 128; range in size, 122–128 (125.5).

EASTERN LOWLANDS: Maralbashi, 126, 127, 128; Yarkand, 127, 128, 130; Khotan, 126, 127; Cherchen Darya, 127; Lop Nor, 127; range, 126–130 (127.3).

FOOTHILLS AND MOUNTAINS: Samarkand, 129, 129; Tashkent, 132; Djarkent, 130, 131, 133, 133; Kuldja, 133; Bogdo Ola, 129; Sanju Pass, 126, 129; Fergana, 126, 127, 128, 129, 130, 130; northeastern Afghanistan, 125, 125, 128; range, 125–133 (129).

Dendrocopos syriacus

The geographical variation of the Syrian Woodpecker is slight, and it seems best to me not to recognize any subspecies. I consider therefore that *milleri* Zarudny, 1909, type locality, Kuh i Taftan Volcano, Persian Baluchistan; *transcaucasicus* Buturlin, 1910, type locality, Azerbaijan; and *balcanicus* Gengler and Stresemann, 1919, type locality, Macedonia, are synonyms of *syriacus* Hemprich and Ehrenberg, 1833, type locality, Syria.

Gengler and Stresemann found that their specimens from Macedonia had a less slender bill and were more heavily streaked on the flanks than the birds of Asia Minor and the Near East, and they named them *balcanicus*. However, von Jordans (1940, *Izv. Tzar. Prirod. Inst. Sofiya*, vol. 13, p. 128) found that the difference in the streaking was most inconstant and could detect no difference in the shape of the bill. The material that I have seen supports von Jordans and shows that such difference as exists in the streaking is very slight. Dr. Stresemann tells me that he now agrees that *balcanicus* cannot be recognized. Buturlin stated that the birds of Transcaucasia and Azerbaijan differed from *syriacus* in several slight respects "but chiefly by having more white in the tail," but the material that I have seen from Azerbaijan does not differ from topotypical *syriacus* and shows that *transcaucasicus* is not valid.

The white markings in the tail do, however, show an interesting variation in Iran. In the material that I have seen, specimens from Azerbaijan and the western Zagros (Kermanshah to Luristan and Bakhtiari) show the same range of individual variation as specimens from Asia Minor, Near East, and Europe, but the white markings decrease in number and size farther east as we approach the range of *D. assimilis*. In Fars the spots are smaller than in specimen A in figure 2 and are reduced to a small white tip and one spot above the tip. This spot is

smaller than in specimen A and is found only on the outer web in about half of the specimens. The number and size of the white spots vary individually, and some specimens from the western part of the range are similar to the birds of Fars, but, generally speaking, the spots are more reduced in the latter. In two specimens from Yezd (one of which, D, is illustrated in fig. 2), the white markings are reduced further, and the tail is all black (C) in three of four specimens from eastern Kirman, the easternmost population. The fourth specimen, however, shows one white spot and a white tip on each feather. *Dendrocopos syriacus* and *D. assimilis* do not overlap in Fars and Yezd and may

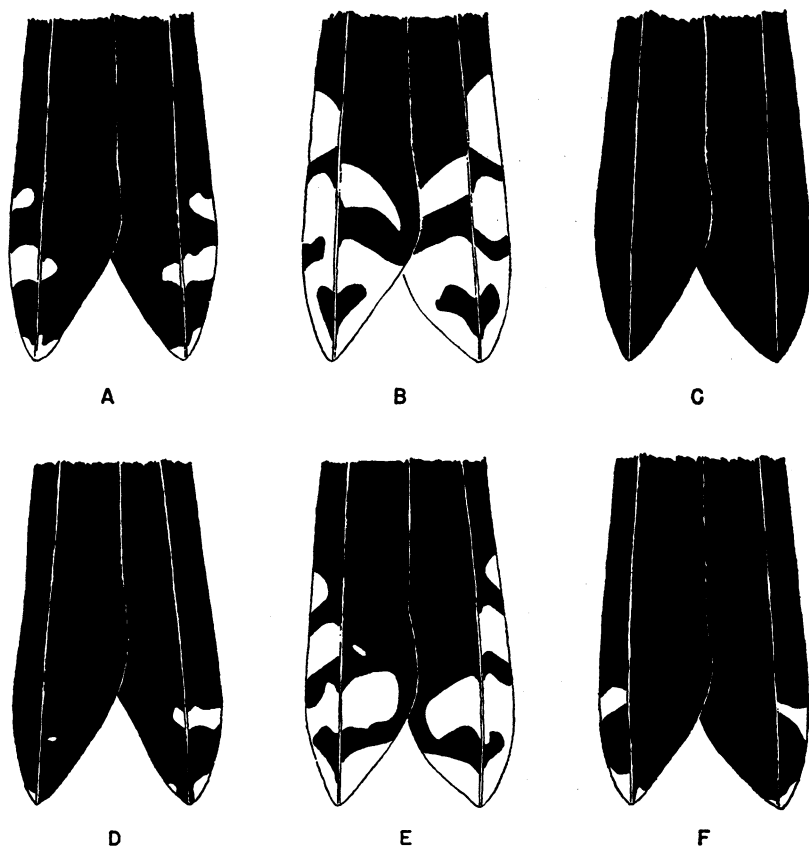


FIG. 2. Variation in the color pattern of the outer pair of rectrices. A. *Dendrocopos syriacus* from the Near East. B. *D. assimilis* from Bahawalpur. C. *D. syriacus* from eastern Kirman. D. *D. syriacus* from Yezd. E. Hybrid from Isin, Laristan. F. Hybrid from Hajiabad. See text for location of Isin and of Hajiabad.

not overlap in eastern Kirman, though their ranges seem to meet in this region, but nevertheless this decrease in the white area suggests an instance of character displacement, as *assimilis* (B) has a very white tail.

It seems best to me not to recognize a subspecies of *syriacus* in eastern Iran, though Zarudny states that the four specimens he collected on the Kuh i Taftan Volcano in northern Persian Baluchistan and named *milleri* have a longer wing and more slender bill than the specimens he collected in western Iran. Three of the specimens are adult and are males and measure, according to Zarudny, wing 132, 135.4, 139, and bill from the corner of the mouth 36.4, 36.8, 38, as against 123.7–130.7 and 32.8–35.2 in nine males from western Iran, but, as shown below, I have measured individuals from other parts of the range of *syriacus* that are as large as the specimens of *milleri*. It is possible, however, that my measurements were not taken in a comparative manner and that Zarudny's birds average larger, because he states he collected them at high altitudes. The shape of the bill is not constant in eastern Iran. Zarudny mentions also that the red area on the head is more "bow-shaped" in *milleri* than in *syriacus* but adds that the crown feathers of his specimens are extremely worn.

Measurements of adult males in *D. syriacus* follow:

BALKANS: Eight specimens, wing, 130–135 (132.8), bill measured from the corner of the mouth, 29.5–35 (32).

ASIA MINOR AND NEAR EAST: Nine specimens, 124–136 (129.7), 28–34 (32.3).

AZERBAIJAN: Ten specimens, 126–135 (130.4), 34–37 (35).

ZAGROS: Eleven specimens, 127–133 (130), 31–35 (33.1).

KIRMAN: Ten specimens, 127–133 (130.4), 31–35 (33.5).

The bill, measured from the skull, measures 29.5–39 (33.5) in these 37 males.

Dendrocopos syriacus AND *Dendrocopos assimilis*

Dendrocopos assimilis belongs to the group of closely related species which includes *syriacus*, *major*, *leucopterus*, and *himalayensis*. Some authors have suggested that *assimilis* and *syriacus* are perhaps conspecific, but their breeding ranges overlap in southeastern Iran, and they are quite distinct morphologically (see below). Zarudny's tables of distribution (1911, Jour. Ornith., vol. 59, p. 210) show that the two species breed in northern Persian Baluchistan, though, to my knowledge, *syriacus* is known from this region only from the Kuh i Taftan Volcano (see above) at about longitude 61° 8' E. They appear to overlap in eastern Laristan, though hitherto the westernmost records of *assimilis* were from the region west of Bampur, or about longitude 60° E. However, Koelz has collected three typical specimens of *assimilis* at Isin,

Laristan, at about longitude $56^{\circ} 15'$ E. on December 18 and 19, 1939, and a typical specimen of *syriacus* at Balvard, or about longitude $56^{\circ} 5'$ E., on the border of Laristan and Kirman on December 31, 1939. I have also examined *syriacus* from Keshar near Bandar Abbas. Isin is about 15 kilometers almost due north of Bandar Abbas, and Keshar, which is at about longitude $55^{\circ} 58'$ E., is about 30 kilometers west of Isin and Bandar Abbas. We therefore find the two birds in the same region.

Two other specimens collected by Koelz are of special interest, as they appear to be hybrids of *assimilis* and *syriacus*. One of them was taken at Isin at the same time as the specimens of *assimilis*, and the other at Hajiabad, or about longitude $55^{\circ} 55'$ E. and 115 kilometers northwest of Isin, on December 27, 1939. The two specimens are adult males. The specimen from Isin (fig. 2E) is intermediate between *syriacus* and *assimilis* in the pattern of its tail and crown. It is red on the anterior and posterior parts of the crown but black in the center and at the sides of the crown. In *assimilis*, the crown is red in the adult male behind the white frontal band but black in *syriacus* except on the nape. I am not certain that the specimen from Hajiabad (fig. 2F) is a hybrid, but it does have a single red feather on the anterior part of the crown. This feather may have been retained from the juvenal plumage, which is red on the crown in both species, but the specimen is adult and had not molted recently, as the plumage shows signs of wear. The measurements of the two specimens (Isin, wing length 125, bill length 32; Hajiabad, 128, 32) are about intermediate between the average measurements of *syriacus* and those of *assimilis*, and the bill is a little more slender than normal in *syriacus*. In 48 males of *syriacus* the wing measures 124–136 (130.5) and the bill 29.5–39 (33.5), as against 115–126 (118) and 28–32 (30) in 14 of *assimilis*.

Dendrocopos syriacus thus hybridizes, at least occasionally, with *assimilis* at the eastern end of its range, as it does in Europe with *major*. The latter and *syriacus* are much more similar morphologically than they are to *assimilis* but nevertheless keep distinct as they replace each other ecologically. In southeastern Iran, however, the lack of suitable habitat largely prevents ecological separation and favors competition and the development of isolating mechanisms, such as the difference in size and color pattern, a red versus a black crown in males, and a white versus a black tail in both sexes. The white spots on the tail and the red crown are ancestral characters in both *syriacus* and *assimilis*, but it seems significant that the red crown is retained in *assimilis* and the white spots disappear or become greatly reduced in the eastern

populations of *syriacus* (fig. 2). This character displacement argues for separate species. The deep invasion of the range of *major* by *syriacus* was made possible by the fact that the two had become compatible ecologically in isolation, but the ecological competition in southeastern Iran prevents deep mutual invasion. In this region, both species have been reported as inhabiting poplars, but farther west *syriacus* frequents chiefly oaks which are lacking or scarce in southeastern Iran. The trees most favored by *assimilis* are smaller ones, chiefly tamarisks.

I am especially grateful to Mr. M. Traylor of the Chicago Natural History Museum for writing to me about the hybrids and for sending them to me along with other specimens collected by Koelz.

Dendrocopos darjellensis

The Darjeeling Pied Woodpecker inhabits the Himalayas from Nepal eastward to northern Yunnan and western Szechwan, south to the Shan States and Chin Hills in Burma and the hills of Assam south to the Lushai Hills. No subspecies were recognized until Rensch (1924, Abhandl. Ber. Mus. Dresden, vol. 16, no. 2, p. 38) showed that the birds from the eastern end of the range have a distinctly shorter bill. In the three specimens examined by Rensch from the Wa Shan in eastern Sikang the bill measured 29 in one male and 26.5, 28 in two females and, in two specimens seen by me from western Szechwan, measures 31.5 in one male and 29 in one female, as against 36.5–40 (37.6) in 13 males and 33–37 (34.7) in 13 females measured by me from Sikkim and Darjeeling. This clear-cut difference warrants the recognition of two subspecies: *desmursi* Verreaux, 1871, type locality, Muping (now Paohing) in Sikang and Szechwan; and nominate *darjellensis* Blyth, 1845, type locality, Darjeeling and Nepal, in the rest of the range. Rensch stated also that *desmursi* was more whitish on the flanks, but this is not confirmed by the two specimens I have seen from Szechwan.

The two races probably intergrade in central or western Sikang, as the four birds collected by Ludlow (1951, Ibis, p. 571) in Pome in southwestern Sikang (between about longitude 95° 05' E. and longitude 95° 15' E.) have a somewhat shorter bill than those of Sikkim and Darjeeling, measuring 34, 34.5 in two males and 31, 31 in two females.

Two other populations have been described in recent years: *fumidus* from the Naga Hills by Ripley (1951, Postilla, no. 6, p. 3), and *diatropus* from the Lushai Hills by Koelz (1954, Contrib. Inst. Reg. Explor., no. 1, p. 22), but after examining material from these regions I think it is best to synonymize these names with nominate *darjellensis*.

I am indebted to Dr. Ripley for lending me the type of *fumidus*, a

male, and the two female paratypes, and to Dr. Storer for lending me the paratype of *diatropus* and a series from the Naga Hills collected by Koelz in 1950 consisting of seven adult females and three immature birds.

I find that the 10 adults from the Naga Hills do not differ constantly from specimens of nominate *darjellensis* from Sikkim and Darjeeling, but they average slightly darker below, a little richer yellow, more "smoky" on the throat and breast, and redder on the vent. These differences were mentioned by Ripley who added that the red of the nuchal patch was darker in the male and that the under parts showed a tendency to be more heavily streaked, but I can see no difference in the streaking, and the red of the nuchal patch is matched in shade by one-third of the males from Sikkim and Darjeeling. I believe, furthermore, that the differences in coloration between the two series can be accounted for by the fact that the birds from the Naga Hills were collected in 1950, whereas those from Sikkim and Darjeeling were collected between 1870 and 1892 and had faded to some extent. Dr. Ripley did not mention his comparative material, but it seems to me that skins of comparative age should be examined before *fumidus* is recognized, as the differences mentioned are of the sort that one would expect between freshly collected skins and old ones. Specimens in juvenal plumage from Sikkim and the Naga Hills are identical.

Ripley mentioned that *fumidus* measured smaller than topotypical nominate *darjellensis*, but the wing length of the male measures 126.5 and is similar to that of a series of 13 specimens of the latter which measures 125–131 (127.5). However, the nine females from the Naga Hills are smaller, measuring 121–126 (123.7) as against 124–131 (126.4) in 13 from Sikkim and Darjeeling. This difference does not seem to be of taxonomic importance, particularly as no difference seems to exist in the measurements of the males.

The female paratype of *diatropus*, which is the only specimen that I have seen from the Lushai Hills, is paler below, less yellowish, than the specimens from the Himalayas and Naga Hills, but it was collected on April 17 and its plumage is quite worn. I have not seen the type, the only other specimen of *diatropus* known, but as it was collected on April 7 its plumage was probably worn also. It is possible that a distinct race inhabits the Lushai Hills, but this requires confirmation, as the population in the neighboring Chin Hills is identical with topotypical nominate *darjellensis* as shown by Stresemann (1940, Mitt. Zool. Mus. Berlin, vol. 24, p. 235) who has compared freshly collected skins from the Chin Hills and Sikkim. Two specimens in worn plumage are insuf-

ficient to establish the validity of *diatropus*, and, until more material becomes available, it seems best to synonymize this name with nominate *darjellensis*.

Dendrocopos cathpharius

The Lesser Pied Woodpecker ranges from central Nepal eastward through the Himalayas and Sikang to southwestern Kansu, northern and western Szechwan, and Hupeh, and south in the hills of Assam south of the Brahmaputra to the Lushai Hills, Burma to northern Siam, and Yunnan to northern Laos and northwestern Tonkin. Five subspecies have been recognized hitherto, but I find that the population of southwestern Sikang is distinct. It is described below as a new subspecies. The other five races are: nominate *cathpharius* Blyth, 1843, type locality, Darjeeling, which inhabits the Himalayas; *pyrrhothorax* Hume, 1881, type locality, Manipur, in the hills of Assam south of the Brahmaputra; *tenebrosus* Rothschild, 1926, type locality, Shweli-Salwin Divide, western Yunnan, which ranges from western Yunnan south to Tonkin, Laos, and northern Burma to the Shan States and northern Siam; *pernyi* Verreaux, 1867, type locality, Szechwan, which ranges from the Likiang Range in Yunnan eastward through Sikang to northern and western Szechwan, and southwestern Kansu; and *innixus* Bangs and Peters, 1928, type locality, Hupeh, which is known only from central Hupeh.

An additional form has been described by Koelz (1954, Contrib. Inst. Reg. Explor., no. 1, p. 22) from the Lushai Hills, but I find that this form, which he named *cruentipectus*, cannot be distinguished from *pyrrhothorax*. It is based on three specimens which Koelz states differ from *pyrrhothorax* by having the "light areas somewhat paler and duller, black markings on breast and sides deeper." However, I find that the two paratypes of *cruentipectus*, which were kindly lent to me by Dr. Storer, fall perfectly within the range of individual variation of a series of 12 specimens of *pyrrhothorax* in comparative plumage, eight of them from the Naga Hills and four from Manipur.

Dendrocopos cathpharius is not well represented in most collections, and before the new subspecies is described it will be useful to review briefly the characters of the five valid races named above. Nominate *cathpharius* is buffy white on the cheeks and throat and fulvescent buff on the rest of the under parts which are broadly streaked with black, the under tail coverts being faintly tipped with red. In most specimens a faint and vaguely defined patch of red is present on the upper breast. The male is red on the nape, and this pigment extends to the sides of

the neck to form a broad band behind the ear coverts. The female is black on the nape, but the coverts are bordered posteriorly with red also, but the red is paler and the band is narrower and less sharply defined than in the male. *Pyrrhothorax* is whiter on the cheeks, less fulvescent below, a little more heavily streaked with black, and has a very well-defined and very large patch of red on the breast. It is much redder on the under tail coverts, the red pigment extending to the region of the vent, and its ear coverts are bordered posteriorly with red as in nominate *cathpharius*. *Tenebrosus* is, as its name suggests, much darker on the cheeks, throat, and under parts than the first two races, dull cinnamon or "smoky" brown on the cheeks and throat, and dull yellowish brown on the rest of the under parts which are also more heavily streaked with black. The red patch on the breast is large, and the under tail coverts are red as in *pyrrhothorax*, but the ear coverts are not bordered posteriorly with red in the female or in most males, though a faint trace of red persists in some males. *Pernyii* is similar to *tenebrosus* but more grayish, less yellowish, below and is much more heavily marked with black on the sides of the breast, the black areas coalescing on the middle of the breast to form a large black spot below the red patch. *Innixus*, which is known from only two specimens, was not examined by me but is said to be similar to *pernyii* although paler and less streaked. The wing length of males measures: nominate *cathpharius*, 100–102 (101) in six; *pyrrhothorax*, 97–100 (98) in seven; *tenebrosus*, 99–105 (102) in eight; *pernyii*, 108–112 (110) in five; and 107 in *innixus*, according to Bangs and Peters.

The three specimens that Ludlow collected in Pome in southwestern Sikang (1951, *Ibis*, p. 571) were identified by him as nominate *cathpharius*, but it is clear from Ludlow's statement that they differ from the latter, as he states they have "a well-marked crimson gorget, and the under tail-coverts are also crimson." I find that they combine to a curious degree the characters of nominate *cathpharius* and *tenebrosus*. In view of the fact that they cannot be identified as either of these two, it seems best to describe them as a new subspecies.

***Dendrocopos cathpharius ludlowi* Vaurie, new subspecies**

TYPE: British Museum (Natural History) No. 1948-27-96; original collector's no. 5359; adult male; Tsera, Pome, "southeastern Tibet" [= southwestern Sikang]; February 8, 1947; Frank Ludlow, collector.

DIAGNOSIS: Similar to *tenebrosus* in general coloration, being dark (see above) on the cheeks, throat, and under parts which are heavily streaked, but differs from *tenebrosus* by being similar to nominate *cath-*

pharius in having the ear coverts bordered posteriorly with red in both sexes (see above), very broadly and conspicuously so in the male. In *ludlowi*, the red patch on the breast is smaller than in *tenebrosus* but very well marked, as stated by Ludlow, much more so than in nominate *cathpharius*; the under tail coverts are tinged with red but less so than in *tenebrosus*.

MEASUREMENTS: Wing length, male, 102; females, 101, 104. The three specimens are adult.

RANGE: Known only from the three specimens in the collection of the British Museum collected by Ludlow in Pome, southwestern Sikang. The two females were collected at Dem on February 7, 1947, and Tangme on February 17, 1947. These two localities and Tsera are within 9 miles of one another in the valley of the Po Tsangpo, between about latitude 95° 05' E. and latitude 95° 15' E., according to the map published by Ludlow in 1951 (*loc. cit.*).

I take pleasure in naming the new race for Frank Ludlow who has done so much to advance our knowledge of the birds of southeastern Tibet and neighboring Sikang.

Dendrocopos medius

Seven subspecies of the Middle Spotted Woodpecker were recognized by Peters (*op. cit.*, pp. 188–189), but the geographical variation is slight, and it seems quite sufficient to me to recognize only three: (1) nominate *medius* Linnaeus, 1758, type locality, Sweden, with *splendidior* Parrot, 1905, type locality, Albania, and *lilianae* Witherby, 1922, type locality, northwestern Spain, as synonyms; (2) *caucasicus* Bianchi, 1905, type locality, Caucasus, with *anatoliae* Hartert, 1912, type locality, Turkey, and *laubmanni* Götz, 1923, type locality, Transcaucasia, as synonyms; and (3) *sancti-johannis* Blanford, 1873, type locality, Fars, southern Iran.

The geographical variation is clinal and involves an increase in the black pigment and an intensification of the yellow and red pigments from north and south and southeast in Europe and eastward across Asia Minor to Transcaucasia and the Caucasus, the cline becoming reversed in southern Iran.

The population of the Balkans ("*splendidior*") averages slightly darker and more richly colored than nominate *medius* from western and northern Europe, the back being a little purer black, less brownish, the tail more distinctly banded with black, the breast more yellowish, and the red pigment brighter. However, all these differences are very slight and not constant, and most authors, such as Stresemann

(1920, Avifauna Macedonica, Munich, Dultz, p. 213), Ticehurst and Whistler (1932, Ibis, p. 74), and Hartert and Steinbacher (1935, Die Vögel der paläarktischen Fauna, Ergänzungsband, p. 371) consider that *splendidior* is a synonym of nominate *medius*. I agree that *splendidior* cannot be recognized, but, nevertheless, it is of interest to note that the birds of the Balkans represent a stage on the cline of increasing color saturation which runs to the Caucasus. The population of northwestern Spain ("*liliana*") is indistinguishable from that of the Balkans. The material that I have seen from Spain and the Balkans consists of the type and paratypes of *lilanae* (eight specimens), 14 topotypes of *splendidior*, and 12 other specimens from Macedonia, Bulgaria, and Romania.

The population of Turkey ("*anatoliae*") represents also a stage on the cline but is very poorly differentiated and not separable from *caucasicus*. It differs from the latter only by showing a tendency to be less brightly colored below, but about two-thirds of the 24 specimens that I have seen from Turkey are indistinguishable from seven specimens from the Caucasus and three from Transcaucasia. The specimens from the Caucasus and Transcaucasia are identical, showing that *laubmanni* is not valid as stated earlier by Hartert and Steinbacher (*loc. cit.*). The 24 specimens from Turkey include the type and paratypes of *anatoliae*.

Hartert stated that *anatoliae* differed constantly from nominate *medius* and *caucasicus* by being more heavily banded with black on the tail and by having a shorter wing, "3-9 mm. shorter." However, although the birds of Turkey are more heavily and symmetrically banded with black than nominate *medius*, they do not differ constantly from *caucasicus* in this respect. In fact, 18 of the 24 specimens are identical with the 10 of *caucasicus*. The wing lengths listed below show no differences between the birds of the Caucasus and those of Turkey and show only a slight one in average between these populations and nominate *medius*.

The population of the Zagros in Iran (*sancti-johannis*) can be distinguished from *caucasicus*, though the difference is relatively slight. It is paler below, whiter on the throat and especially on the breast, the yellow pigment being more restricted to the lower and central parts of the abdomen and paler in shade. The tail of *sancti-johannis* is heavily banded with black as in *caucasicus*, but the back averages a little more brownish, less pure black. *Sancti-johannis* differs from nominate *medius* by being whiter on the throat and breast and by being more heavily banded with black on the tail. Its measurements average slightly smaller than in the other two races.

WING LENGTH OF ADULT MALES: Nominate *medius*, Sweden, 123, 125, 126, 126, 128 (125.6); Germany, 124, 125, 125, 125, 126, 126, 127, 127, 128, 130 (126.3); Balkans, 123, 124, 125, 125, 125, 125, 126, 126, 126, 127, 127, 130, 130 (126.3). *Caucasicus*, Turkey, 119, 120, 120, 121, 122, 122, 122, 123, 124, 124, 124, 124, 124, 125, 126, 126, 127 (123.3); Caucasus, 123, 123, 124, 125 (123.8). *Sancti-johannis*, Zagros, 120, 120, 120, 122, 123, 123, 126 (122).

Dendrocopos leucotos

The White-backed Woodpecker ranges from Scandinavia, Germany, and southern Europe eastward to the Caucasus, and, in the north, eastward across Russia, Siberia, and northern Mongolia to the southern coast of the Sea of Okhotsk, Sakhalin, Japan, and northern China, with isolated colonies in Kamchatka, western Szechwan, northern Fukien, Formosa, the Ryu Kyus, and Pyrenees. It varies geographically, and 15 subspecies have been recognized by Peters (*op. cit.*, pp. 189–192). An additional one has been described recently by Cheng (1956, *Acta Zool. Sinica*, vol. 8, p. 140) from the lowlands of western Szechwan which he named *tangi*, bringing the number to 16. *Tangi*, as well as *fohkiensis* from Fukien and *insularis* from Formosa, was not studied by me. The 13 forms that remain are Palearctic and belong, in my opinion, to only nine valid subspecies. These are listed below.

1. *Dendrocopos leucotos lilfordi* Sharpe and Dresser, 1871, type locality, Epirus. This race differs distinctly from nominate *leucotos* by being barred with black on the rump, and also by being more abundantly and heavily streaked with black below on the sides of the body and more broadly and symmetrically banded with black on the outer tail feathers. The rump is white in nominate *leucotos*, not barred. The range of *lilfordi* extends from the Balkan Peninsula from Bosnia and Dalmatia eastward to Albania, Bulgaria, and Greece to Asia Minor, Transcaucasia, and the Caucasus. It is found also in the Pyrenees where it is rare, and was formerly reported from Corsica. The records from Corsica date back to the middle of the nineteenth century, and those from the Pyrenees were equally ancient until a relict population was rediscovered in 1936.

2. *Dendrocopos leucotos leucotos* Bechstein, 1803, type locality, Silesia, with the following synonyms: *sinicus* Buturlin, 1907, type locality, northeastern China near Peking; *ussuriensis* Buturlin, 1907, type locality, southern Ussuriland; *vozniesenskii* Buturlin, 1907, type locality, Kamchatka; and *saghalinensis* Yamashina, 1931, type locality, Sakhalin.

3. *Dendrocopos leucotos uralensis* Malherbe, 1861, type locality, Bashkiria in the Urals. This race and nominate *leucotos* are discussed

jointly. Nominate *leucotos* is white on the rump and moderately well spotted with white on the wings and streaked with black below, *uralensis* being similar but much whiter on the wing and back and less streaked below. The difference on the back and wings is very conspicuous when typical specimens are compared, but the subspecific status of the populations of Siberia has been the subject of many discussions based on conflicting opinions. The situation is complicated by individual variation, the fact that the birds are migratory, according to Stegmann (1936, Jour. Ornith., vol. 84, pp. 110–112), and also because the populations of central Siberia do not differ taxonomically from those of Europe from which they are separated by a very wide zone inhabited by the paler birds. The latter, which Stegmann calls “true *uralensis*,” breed from the southern Urals and Bashkiria eastward in the plains of western Siberia to the region of Barnaul, north to Samarovo at the mouth of the Irtysh, south to the forested steppes to at least Kokchetav. Stegmann emphasizes strongly that no dark birds [i.e., nominate *leucotos*] breed in this region, but farther east, where the mountains are reached, all authors now agree that the populations become darker again and do not differ taxonomically from nominate *leucotos*. The range of the latter is then resumed, after being interrupted by that of *uralensis*, and, in my opinion, extends all the way to the Pacific.

Stegmann (*loc. cit.*) and Johansen (1955, Jour. Ornith., vol. 96, p. 390) state that the birds of Amurland and Ussuriland are darker than nominate *leucotos* and would recognize a distinct subspecies in these regions which Stegmann calls *voznesevskii* and which Johansen calls *ussuriensis*; in 1930 Stegmann had called it *ussuriensis* (Jour. Ornith., vol. 78, pp. 467–469). However, Voous (1947, Limosa, vol. 20, pp. 66–73), and Gladkov (1951, Birds of the Soviet Union, vol. 1, pp. 591–598) consider that the populations of Amurland and Ussuriland are not separable from nominate *leucotos* and that *ussuriensis* is a synonym. I have compared 60 specimens from Amurland and Ussuriland with a series from Europe and share the opinion of Voous and Gladkov. Three specimens in this large series are very pale and similar to *uralensis*, while five or six are more heavily streaked with black below than nominate *leucotos*, but the remainder are indistinguishable from the latter.

I believe that *sinicus* also should be synonymized with nominate *leucotos*. The only difference I can discern between specimens from Europe and those from Korea and those from northern China is slight and not constant, the birds of Korea and China averaging somewhat

better streaked below. This tendency does not warrant the recognition of *sinicus*. Austin (1948, Bull. Mus. Comp. Zoöl., vol. 101, p. 164) has mentioned already that the birds of northern Korea are not separable from those of Amurland and Ussuriland and that *sinicus* is not well differentiated. I did not examine specimens from Kamchatka (*voznensenskii*) or Sakhalin (*saghalinensis*), but, according to Stegmann (1936, *loc. cit.*), *voznensenskii* cannot be distinguished from the birds of Transbaikalia which I believe are nominate *leucotos*, while those of Sakhalin are identical with the latter according to Gizenko (1955, Birds of Sakhalin, Moscow, Akademia Nauk, p. 199).

4. *Dendrocopos leucotos takahashii* Kuroda and Mori, 1920, type locality, Dagelet Island, Sea of Japan. This race, which is restricted to Dagelet, differs from nominate *leucotos* by being much darker. In the only specimen that I have seen the feathers of the rump have black shaft streaks, the white spots are smaller, and the white bars on the wing are narrower, than in nominate *leucotos*, and the sides of the breast and flanks are also much more heavily streaked with black. *Subcirris* of Hokkaido, *stejnegeri* of northern and central Hondo, and *namiyei* of southern Japan are more buffy, less white, on the breast than in the specimen of *takahashii*, the white spots and bars on the wing are larger in *subcirris* and *stejnegeri*, the wing and bill longer in *subcirris*, and the wing longer in *stejnegeri*. According to Kuroda and Mori, the wing length of five males of *takahashii* measures 141, 142, 143, 146, 146 and the bill length 39, 39.5, 40, 40, 40. In the specimen that I have seen, a male, the wing measures 146 and the bill 39.

5. *Dendrocopos leucotos quelpartensis* Kuroda and Mori, 1918, type locality, Quelpart Island. This race, which is restricted to Quelpart, is more buffy on the breast than *takahashii* and more darkly and extensively tinged with red on the rest of the under parts. It is similar to *stejnegeri* but can be distinguished from it by its having smaller white spots on the wing and its being a little paler below, less buffy, less tinged with red, and somewhat less streaked with black. It appears to be a little smaller than *stejnegeri*, if one may judge by the two specimens that I have seen; these are males with a wing length of 148, 151 and a bill length of 37.5, 39.

6. *Dendrocopos leucotos subcirris* Stejneger, 1886, type locality, Hokkaido.

7. *Dendrocopos leucotos stejnegeri* Kuroda, 1921, type locality, central Hondo.

8. *Dendrocopos leucotos namiyei* Stejneger, 1886, type locality, southern Hondo. This race and *stejnegeri* and *subcirris* are best dis-

cussed together. The geographical variation in the populations of Japan takes the form of a cline of increasing color saturation and decreasing size running from north to south through the archipelago. The population (*subcirris*) of Hokkaido is pale and resembles nominate *leucotos* but is more buffy on the throat, less white, and its lower throat is more heavily bordered with black. It is larger and has a more powerful bill, broader and longer. The measurements of 10 males each of *subcirris* from Hokkaido and nominate *leucotos* from Europe are: *subcirris*, wing length, 151, 151, 152, 152, 153, 153, 153, 154, 156, 156, (153.1); bill length, 43, 43, 43, 43, 43, 44, 44, 44, 44, 44 (43.5); nominate *leucotos*, 140, 144, 145, 146, 148, 149, 150, 150, 150, 152 (147.5); 37, 37.5, 38, 38.5, 39, 40, 40, 41, 42, 43 (39.6). *Subcirris* is restricted to Hokkaido and neighboring Kunashiri Island in the southern Kuriles. The populations of northern and central Hondo (*stejnegeri*) are darker and smaller than *subcirris*, less white on the rump, and below are more buffy, more darkly and extensively tinged with red, darker at the sides of the throat and on the flanks and tail. Ten males of *stejnegeri* measure: 150, 150, 151, 151, 151, 151, 152, 154, 154, 154 (151.8); 37, 39, 39, 40, 41, 41, 42, 42, 42, 45 (40.8). The populations (*namiyei*) of southern Hondo, Shikoku, and Kyushu are said to be darker and smaller than *stejnegeri*. The only specimen of *namiyei* that I have seen, a female, is darker throughout than *stejnegeri* and measures 148, 37. According to Stejneger, the type of *namiyei* (a male, and his only specimen) has a wing length of 146 (wing not flattened), and a bill length ("exposed culmen") of 34.

9. *Dendrocopos leucotos owstoni* Ogawa, 1905, type locality, Amami Oshima, Ryu Kyus. This isolated race is restricted to Amami Oshima and is strikingly differentiated. It is very much darker than any other race and has a black rump, sparingly spotted with white in some individuals. It is dark buff on the throat and most heavily marked with black, the black areas joining broadly across the upper breast. It averages larger than any other race, the wing length of 10 males measuring 155–160 (158.5), but the bill length averages the same as in *stejnegeri*, measuring 39–43 (40.5). Voous (*loc. cit.*) states that the wing length of 27 males of *owstoni* measures 147–149, quoting these measurements from Momiyama. The discrepancy between these measurements and mine suggests that Momiyama's measurements were taken in a different manner, or an error may have been made, as Momiyama's measurements for 13 females are 148–157.5, and these are more similar to the females I have measured, namely, 152–157 in six specimens.

