

the moment. There is little merit in the idea that impalings serve to attract other animals or that they become "tasty" by hanging. That a shrike's inability to eat is caused by a pellet that is ready for ejection, may be, as I have learned from caged birds, a reason for impaling without immediate feeding.

Shrikes prefer to pull small bites from impaled prey. The same thorns to which they have become accustomed are used repeatedly, but, in the course of handling a large object, the position of the prey may be changed and different thorns used. Prey is impaled through various parts of the body, but heads of birds and mammals often are removed and impaled separately; commonly they are eaten first. Schreurs found that *collurio* will impale insects so that they remain alive on the thorn. *Ludovicianus* may do this, but he claims that *senator* always kills an insect. Interesting is the attempted defense of impalings by *collurio* when a human approaches. Little of this is noted in *ludovicianus* and *senator*, but in captive Loggerheads it is pronounced. Probably in the wild the shyness of these two species overcomes the urge to defend.

Schreurs' statement that the impaling instinct is in operation throughout the year is fully borne out by observations upon permanently resident shrikes both in America and in the Old World. The instinct may be an important element of the breeding cycle, but it must be remembered that it develops independently of this and makes its appearance in young captive birds that have been separated from their parents at an early age. It is vital to the existence of the shrike at all seasons.

The significance of similarities in behavior pattern in distinct species of the same genus lies in the strong evidence they afford for common descent and for adaptation to similar modes of life. The characteristics of shrike behavior are as constant and as obvious as many structural features that relate the three species of *Lanius* under consideration. The inherited behavior is no less conservative in evolution than the structure. The differences between the species consist of relatively small modifications of the behavior pattern. Tolerance of dense floral habitat, degree of aggressiveness, and concealment of impalings are items typical of specific differentiation; they might all be termed "quantitative" differences. Probably there is more dissimilarity in voice, in temperament and in details of movements than has thus far been brought out. In final analysis, the more prominent features of behavior ascertained through a study of natural history prove to be generic or even of family significance.

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SUBSPECIFIC APPRAISAL OF RED-BREASTED SAPSUCKERS

By JOSEPH GRINNELL

Ideas and pertinent materials have accumulated slowly until they have reached a stage which seems to warrant my offering some statements concerning the racial status of some of the birds resident in extreme northwestern California. It will be recalled that this part of the State includes a segment of the "northwest humid coast strip" of North America, and that in this strip many birds are represented by strongly marked subspecies—some forms even being of full specific rating. Furthermore, as is well known, within the full length of this strip, which roughly extends from Prince William Sound, Alaska, to Monterey Bay, California, there is further differentiation of some of the humid-coast forms into minor races, less pronounced but nomenclaturally recognizable. Thus, of the Chestnut-backed Chickadee there are four races, of the Hermit Thrush at least three races, of the Steller Jay four races.

It happens that the northern boundary of California cuts to the seacoast through the humid-coast strip in somewhat intermediate position between the more strongly developed differentiation centers at the south (in central California) and to the northward (Olympic Peninsula and Puget Sound region), with the result that specimens of certain birds taken in California, and doubtless also in Oregon, in the counties adjacent to the inter-state boundary, are with difficulty placed under one subspecific name (of a race to the south) or another (of a race to the north). This raises the whole moot question as to how finely to subdivide, or how grossly to lump, any long series of populations which are uninterrupted in continuity and which show gradual modification throughout the extent of their occurrence.

It is not my purpose in this paper to discuss this big and difficult question at any length, but my aim is to present one certain case. When one sets himself the task of selecting names for all the birds occurring within a given state, as I have for California, he must solve this kind of problem as best he may, on the basis of materials in hand and of concepts which have to do with their interpretation. The student of the ornithology of Oregon has the same problem concerning subspecies from the south that the student of ornithology of California has concerning subspecies from the north.

Then, too, there is the relation of coast-belt forms to those of the territory lying immediately interiorward. The latter, in some instances, dominate the faunal scene clear to the seacoast; for example, in northern California, the Blue-fronted Steller Jay. In other cases the coast-belt forms extend far interiorward; for example, the Chestnut-sided Chestnut-backed Chickadee.

Now as to the Red-breasted Sapsucker: The 1931 (fourth) edition of the A. O. U. Check-list (p. 193) says of *Sphyrapicus varius ruber*: "Winters south to Monterey, California." This statement, which I now believe wrong, was probably based in part, at least, upon my own misunderstanding of the facts; for I had made the same statement previously in several places (for example, Pac. Coast Avif. No. 11, 1915, p. 79). Briefly, I now find no specimen of Red-breasted Sapsucker in available collections from California that I can properly call *ruber*; all, even from the extreme northwest coast belt, are *S. v. daggetti*.

IN DETAIL: True *ruber* is represented before me (this at the time of my writing, in 1935) by specimens from Vancouver Island, coastal British Columbia (a magnificent series in the McCabe collection) and southeastern Alaska. The characters of the race are outstanding, in mass-effect, as compared with *daggetti*. Not one breeding bird from California is found to duplicate exactly any bird in that series of *ruber*. Nos. 44550 and 67827, Mus. Vert. Zool., are juvenals, July 7 and 5, from Carlotta, Humboldt County, and Poker Flat, northwest of Happy Camp, Siskiyou County, respectively. These two birds must represent the breeding population of extreme northwestern California. Difference shown by juvenals, in particular, must of course be inherent differences—at least, not as likely acquired as differences that are shown by old birds. The two skins in question, as compared with specimens in corresponding plumage from the Sierra Nevada and the mountains of southern California, on the one hand, and specimens from Vancouver Island on the other, while showing tendencies toward *ruber* are very much on the *daggetti* side of the "fence"—if we define said fence as being the mid-line between the mean of subspecific characters in each of the two races. The characters here concerned are: Size of bill; depth of sootiness of color tone on sides, chest and back; relative amount of white-flecking on back; yellowish tinge versus whiteness of dorsal flecking; relative sizes of white spots on outer webs of primaries; relative quantity of white at ends of innermost secondaries;

proportion of white to black on innermost webs of central pair of rectrices. In these features *daggetti* lies toward the extreme of small size of bill, paleness of color tones, and restriction in extent of white markings.

There is just one specimen in the MVZ collection from California, representative of all seasons and ages, that is in any troublesome degree equivocal. This is no. 16769, a yearling male, from Cuddeback, Humboldt County, hence from the midst of the coastal redwood belt. Because of its generally dark tone of color, yellowish tone of flecking on dorsum, and especially minimum of white on inner webs of central rectrices, it has until now been labeled *ruber*, rather than *daggetti*. And from its date of capture, October 4, I formerly argued that it was a newly arrived winter visitant from more or less far to the northward within the breeding range of *ruber* proper. Certainly this specimen, given quick comparison with specimens of like age and season from the metropolises of the two races named, could be thrown out of *daggetti*. There is no question but that it is intrinsically a departure from *daggetti* toward *ruber*; it is of slight degree just this. But closest scrutiny now convinces me that in certain features (small size of bill, lesser amount of white tipping on inner secondaries, great extent of [yellow-tinged] white flecking on dorsum) this specimen falls short of *ruber*. Its immaturity and the early date of its capture indicate its having been in or very close to its birthplace, hence not a migrant; its characters are accounted for as somewhat extreme for its population, which population anyway shows intermediacy from *daggetti* toward *ruber*. I have accordingly changed the name on the label of this specimen to read *daggetti*. Since it offered the only evidence at hand that true *ruber* migrates as far as California, if that northern race be migratory at all (Allan Brooks records it as wintering regularly at Comox, on Vancouver Island, and I have just learned that it winters at Victoria and Vancouver), then current statements must be modified. Incidentally the name *ruber* must be expunged from the California "state list;" the total number of forms for California is reduced from 610 to 609. It is as important to subtract as to add!

Now someone with a nose for new opportunities to name subspecies will have sensed from my remarks the fact that Red-breasted Sapsuckers from northwestern California do show intrinsic differences from populations of the Sierra Nevada and to even greater degree from those of southern California. Therefore, if the northwestern California birds are at the same time yet more different from true *ruber*, why shouldn't they constitute a separately nameable form? At the present moment, that is, with only the materials now in hand, I answer that there is nothing to indicate more than gradual blending up and down the coast belt and, at the north, from the coast belt toward the interior. (Specimens from Salem and Corvallis, Oregon, are far nearer to extreme *daggetti* than to *ruber*.)

IN GENERAL: The status of our knowledge of the systematics of American birds falls short of the ideal. Nothing whatever should be taken by the critical systematic student as established fact. Many mistakes made long ago, on basis of insufficient material and inadequate consideration of many kinds of evidence, are carried along, in the A. O. U. Check-list and from text-book to text-book; and they will continue to be carried along until and unless scouted out, as a result of the most critical painstaking scrutiny. Citing an example, does the Red-breasted Sapsucker on the Pacific Coast migrate? Current treatment answers *yes*; but the examination just made, initiated for purely taxonomic reasons, indicates quite to the contrary—that its populations, save for local, chiefly vertical shiftings, are relatively sedentary.

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