

will also be noted that there is a complete overlap of primary index of group A by group B (as also by the more inclusive group C).

This means that no member of the population represented by group A can be distinguished by primary formula from group B or group C. Also, less than 16 per cent of the population represented by group B, and about 21 per cent of the population represented by group C can be distinguished from group A by this method.

Two explanations come to mind: One, Gyrfalcons disperse very widely in winter, and many *F. r. obsoletus* travel westward, even as far as Asia. This explanation requires either that the population of *uralensis* is small compared to that of *obsoletus*, or perhaps that it winters mainly southwest of its breeding range which is occupied in part by *obsoletus* in the winter. Some such situation would be required to explain the two group B birds with primary indices of .93 (Chicago Museum of Natural History no. 157,001, immature female, collected by George Willett, Unimak Island, Alaska, October 13, 1926), and .95 (Chicago Museum of Natural History no. 102,336, immature (?) male, collected by A. S. Loukashkin, Greater Khingan, Manchuria, Asia, December 5, 1938).

A second explanation would be that though there is a tendency for the primary index to approach or surpass 1.00 in Gyrfalcons of western Alaska and eastern Asia, it is not sufficiently invariable to be a reliable diagnostic character. To me this would seem the more likely explanation. I suspect this tendency may be a cline of average condition, running from somewhere in eastern North America westward perhaps into Asia. This might explain Chicago Natural History Museum specimens numbers 130,764 and 130,765, immature females, collected by A. Eastgate at Nelson, North Dakota, November 1, 1905, with primary indices of 1.02, and 1.00, respectively.

Unfortunately, the specimens available to me are few in number, and only one in group B is probably close to its breeding grounds. This is Chicago Museum of Natural History number 376,636, adult male, collected by L. Stejneger on Bering Island, March 23, 1883, primary index .99—in other words, *obsoletus* according to Todd and Friedmann. (There is also an adult female, collected in April at St. Michaels, Alaska, in the collection of the California Academy of Sciences, of which the primary index cannot be exactly taken, but with the less damaged tenth primary still longer than the corresponding complete seventh.)

Consequently, I am not at all sure that there is a Bering Sea coast population than can be successfully distinguished from *obsoletus*. Perhaps these birds are simply that part of subspecies *obsoletus* in which a primary index of 1.00 or more occurs most frequently. (This is an index value apparently not recorded from Greenland, although if variation in this character follows the normal curve, about two per cent of the population should show it.) This would be exactly comparable to the darkest Labrador phase (which does not occur in Greenland), though the other phases, all found in both Greenland and Labrador, differ only in relative frequency. The solution of this problem will require not only an adequate series of breeding birds from the Bering Sea coast of Alaska, but also from the Bering Sea Islands and from the breeding range of *uralensis* in Asia. In this connection it is interesting to note that Dementiev (*Systema avium rossicarum*, 1, 1935:1-288) revives the name *F. gyrfalco grebnitzkii* Severtzow for the birds from Kolyma eastward to Kamchatka and the Commander Islands. In other words, further taxonomic work is needed in Siberia to be certain of the proper name to apply to western Alaskan birds if (1) they are subspecifically distinct from *obsoletus*, and (2) are identical with those of easternmost Asia.—R. M. BOND, *Soil Conservation Service, Portland, Oregon, February 2, 1949.*

**Behavior of Birds During a Forest Fire.**—In the summer of 1943, while serving as a fire-guard in the timbered portion of the Saguaro National Monument (Rincon Mountains near Tucson, Arizona), I had a limited opportunity to observe the actions of a few birds during a forest fire.

The Saguaro National Monument includes within its boundaries a good portion of the Rincon Mountains, and in June, 1943, a forest fire burned over most of the area of Transition Zone in the range. During the early period of the fire I was stationed in a high steel lookout tower to report on the progress and directions of the blaze. My duties required a continuous watch but offered opportunities between reports and fire observations to notice the reactions of several species of birds.

Two nests of the Band-tailed Pigeon (*Columba fasciata*) were in plain view of the lookout tower, and the home ranges of a number of other pairs had been roughly determined during previous weeks

on the mountain. Both visible nests were promptly vacated when the first heavy smoke from the fire reached them, and apparently this was also true at the other nests; pigeons could be seen flying up above the low smoke cloud soon after it had penetrated sections of forest. Most of the pigeons headed for distant points after a brief circling above the smoke, but one member of the pair which occupied one of the visible nests (about 150 feet distant from the observer) was seen to return to the nest after about 15 minutes. This was after the first heavy smoke cloud had thinned out considerably. This pigeon was observed again about 30 minutes after it had returned to the nest. It was sitting quietly and was never seen to leave the nest again. In the dense smoke which enveloped the area later, it may have escaped, but so far as I could tell, it perished on the nest.

As the day progressed, the wind, blowing from the fire toward the lookout tower, carried a low, heavy layer of smoke over the area on which the tower was located. The observation cage itself was well above the thickest of the smoke, however, and I could still see for considerable distances. At about this time I began to notice birds moving just above the thick stratum of smoke. Frequently they were close to the tower and I could identify them as Purple Martins (*Progne subis*) and Violet-green Swallows (*Tachycineta thalassina*). The martins far outnumbered the swallows. I estimated as many as 15 martins near the tower at one time. There seemed to be no doubt as to their activities; they were actively feeding. Evidently numbers of strong-flying insects were being driven upward from the forest by the smoke, or weak-flying species were being carried up by the air currents, or both.

The martins and swallows could be seen diving without hesitation into the heaviest billows of smoke, returning to view in a moment, wheeling, skimming and diving in an active feeding manner. Even up to the time when the smoke had become so thick as to make further observations on the fire almost impossible, and the proximity of the blaze forced evacuation of the tower, the martins and swallows could occasionally be glimpsed, still feeding.

Purple Martins had been observed only once or twice during the previous weeks spent on the mountain; they evidently had been attracted from the desert below, where a colony of considerable size nests in the saguaros of the monument area. The martins and swallows were the only living creatures which seemed to profit by the catastrophe.—JOHN R. HENDRICKSON, *Museum of Vertebrate Zoology, Berkeley, California, November 22, 1948.*

**Notes on Nest-building of the Vermilion Flycatcher.**—A pair of Vermilion Flycatchers (*Pyrocephalus rubinus*) was completing its nest in a cottonwood under which I camped at the San Bernardino Ranch, near Tucson, Arizona, on July 6 and 7, 1947. When discovered the nest was almost completed so that during the heat of the day the female made trips to it only every hour or so. The nest was about 18 feet above ground and built where two small lateral twigs, about four inches apart, came off of one of the main branches of the tree some distance out from the trunk. During a great part of the midday the female perched on dead twigs under the canopy of large willows on the north side of a pond and her brilliantly colored mate did the same in neighboring willows. From these shaded retreats they flew out into the sunshine to catch insects buzzing by, often chasing them in wild gyrations over the pond before finally catching them. Upon having completed a successful mission they returned to one of their favorite perches but not always the same one from which they departed.

Apparently the male took no part in the nest-building activities although occasionally he was observed in the vicinity of the nest. After placing a bit of cobwebby material the female commenced shaping her nest by pushing with her feet and apparently with her abdomen. Her tail while in this position was either held erect or even tilted forward over her back; and her wings, directed upwards, also made a sort of flipping motion up over her back as if they were aiding her in her pushing efforts. Continuing in this fashion she worked counter-clockwise around the outer half of her nest, molding it. On every trip to the nest she worked several minutes from position to position, shaping and enlarging it. These efforts seemed to be directed against the outer part of the nest opposite the side built against the main supporting limb.

Most of the nest-building occurred in the early morning hours, and from my cot just below her I saw and heard her snap strands of spider silk in the central part of the big cottonwood. These she wove into the nest.

During noon of the second day, the male came to inspect the nest-building achievements of the female. He stood on the edge of the almost completed but shallow structure tilting his head from side