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## DISTRIBUTION AND HABITAT RELATIONSHIPS OF THE PHAINOPEPLA

BY JAMES E. CROUCH

*Plates 8, 9, 10*

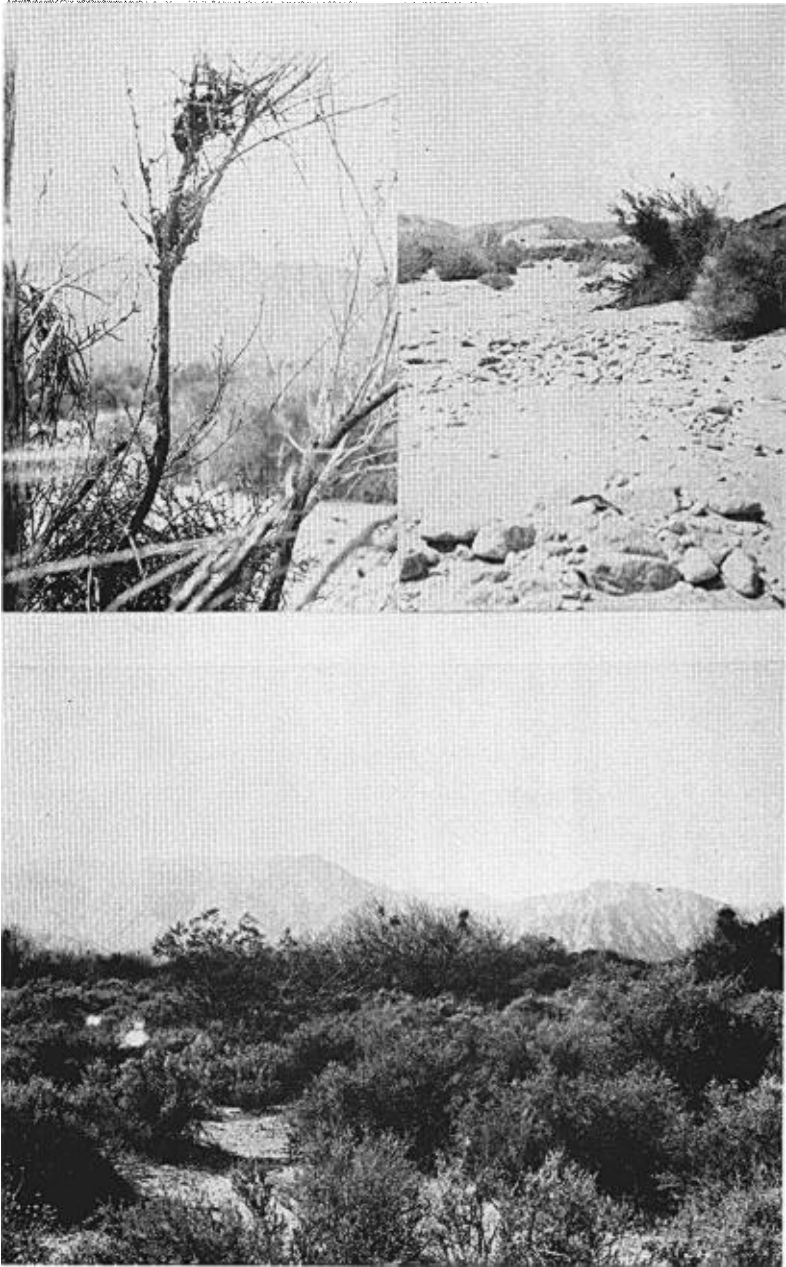
ONE of the most characteristic birds of the southwestern United States is the Phainopepla, *Phainopepla nitens lepida* Van Tyne. On the deserts it frequents the mesquite and mistletoe. In the foothills it is seen among the live oaks, sycamores and sumachs. Everywhere it gives evidence of having a very erratic nature. The purpose of this paper is to attempt to define more clearly the boundaries of the range of the Phainopepla, to present some data as to its abundance in the various parts of its range and finally, as a result of a study of the habitat, to indicate some of the factors influencing its distribution. The literature has been carefully studied and considerable field work was carried out in southern California and in the Yuma region of Arizona.

The distribution maps (Text-figures 1 and 2) were made up from published records of the occurrence of the Phainopepla. They show at a glance the extent of the range, and closer examination reveals other important factors concerning distribution and abundance.

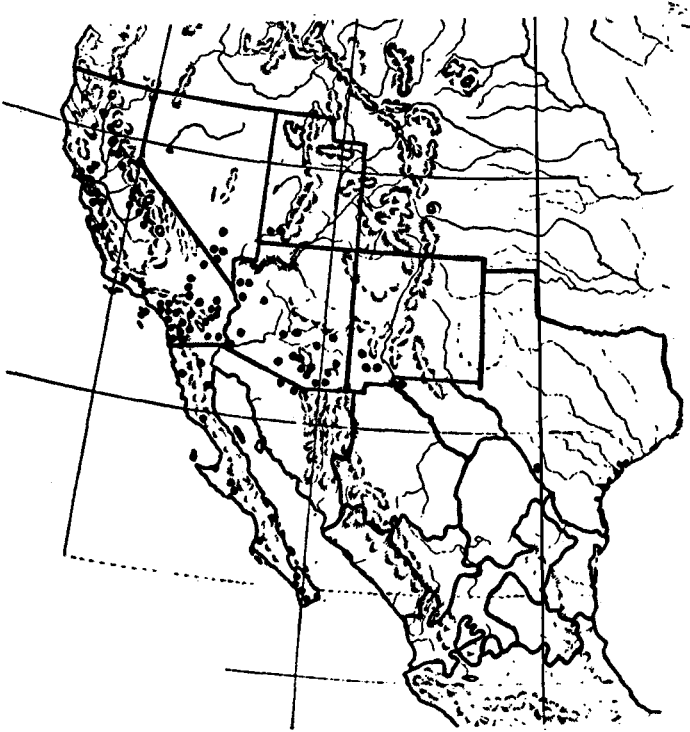
The Phainopepla has been found as far north as Shasta County, California (Townsend, 1887):

I am almost certain that I saw this species at Baird late in June, 1883. Its claim to being a bird of the region is established by the fact of its having been taken at Fort Crook by Captain Feilner. This is probably the most northerly record of its range.

The records in this area are scarce but those that we do have seem to be well founded. Farther south, records are more numerous along the foothills of the Sierras and the coast range. The occurrence of the species in western Nevada and southwestern Utah is indicated, but actual records are scarce. In southern Arizona the species is



(Upper, left) CLUMP OF MISTLETOE SEEDS COLLECTED UNDER A PERCH OF THE PHAINOPEPLA. (Upper, right) TYPICAL DESERT-WASH HABITAT; PHAINOPEPLA IN TOP OF TREE. (Lower) TYPICAL DESERT HABITAT OF THE PHAINOPEPLA. PHOTOGRAPHS TAKEN IN SAN DIEGO COUNTY, CALIFORNIA.



TEXT-FIGURE 1.—Distribution of *Phainopepla nitens lepida* Van Tyne. Each dot represents a published record of occurrence.

common as indicated by many records and the appearance of many Arizona birds in museum collections. There are a few records for southwestern New Mexico and western Texas.

No effort has been made to indicate the range of the species in the Republic of Mexico except in the state of Lower California. The reason for this is that the ranges of the subspecies *lepida* and *nitens* come together or likely overlap in this area and until sufficient material is available for careful examination there is no means of differentiating them. Before the species was divided into the two subspecies, Salvin and Godman (1879–1904) wrote that it occurs throughout central and northern Mexico. They said it was absent from the western coast and probably did not occur much to the southward of Mexico City. In Lower California it is found throughout, except on the higher mountains.

The differences between summer and winter ranges will be discussed along with the detailed accounts of distribution and abundance

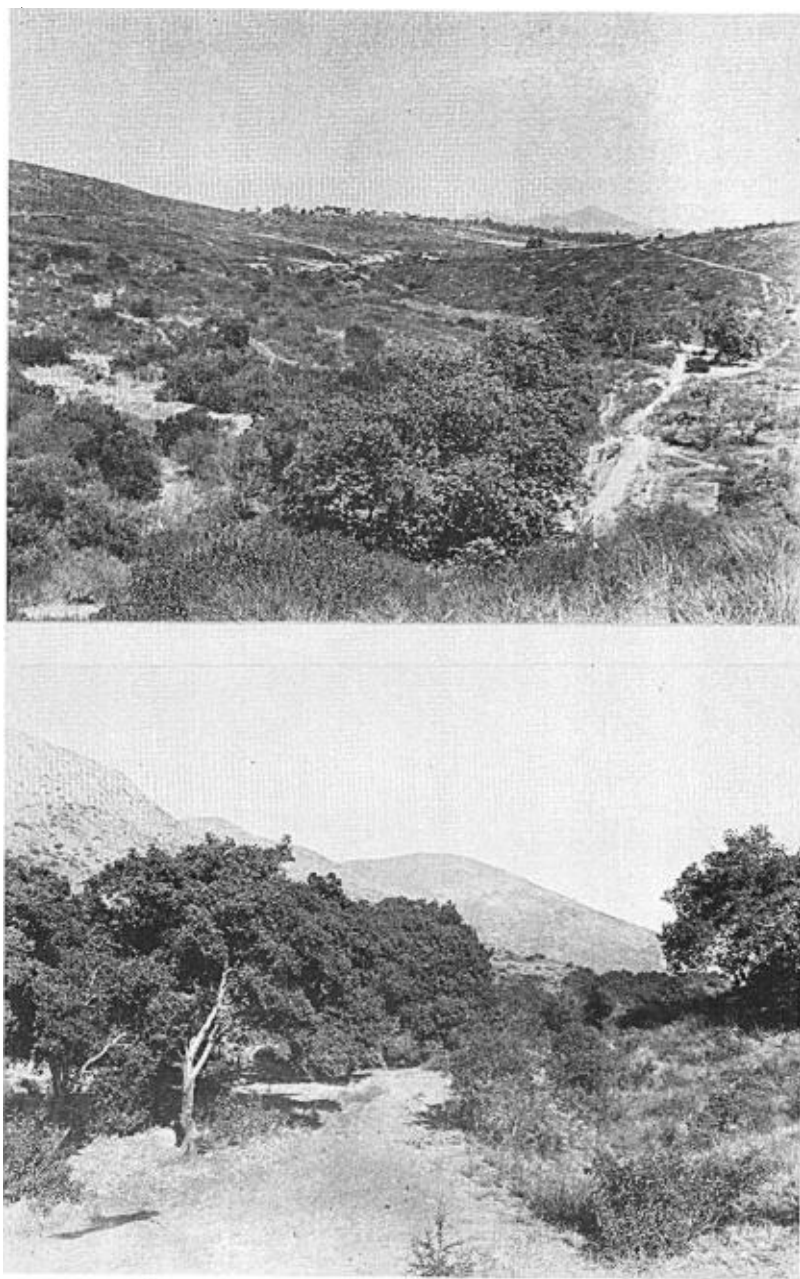


County north to Marin County (Mailliard, 1900) they are common summer visitants locally. They are found also along the western foothills of the Sierras through Eldorado to Shasta County and east of the Sierras into Owens and Panamint valleys (Grinnell, 1915). In the winter they are scarce in the San Diego region. For the past nineteen years the San Diego Museum of Natural History has been conducting bird censuses in the vicinity of San Diego and their records show that the Phainopeplas were seen as follows: 1930–1933, two each year; 1933–1934, one each year; 1935, five; 1936, one; 1937, six; and 1940, six. In the other years none were seen. Gardner (1914) reports that while the Phainopeplas are known to winter in the Claremont (California) region in small numbers, they were common one winter, at least one bird being seen each day. Only one winter record for northern California has been found and this was reported by Muller (1915) for Marysville, in Yuba County. It was a verified record as the bird, a female, was collected.

Although the Phainopepla is usually found at relatively low altitudes, two records are at hand which indicate that it sometimes wanders well up into the mountains. Stevenson (1933) reports seeing one at Mount Pinos, California, on June 12, 1932, a male, flying high among the yellow pines. The elevation was given at 6,200 feet and the bird was considered to be a straggler from the Mohave desert via Cuddy Valley. Hoffman (1933) observed one, a female, at Barley Flats, San Gabriel Mountains, California, on December 30, 1932. The elevation at Barley Flats is 5,500 feet and at the time of the observation there was one foot of snow on the ground. These records should be considered unusual, but they do emphasize the erratic nature of these birds.

Breeding occurs in both the Upper and Lower Sonoran life zones, more commonly in the latter. A number of records are available to indicate that both male and female birds are present during the spring and summer as far north as Sutter County (Follett, 1933). While no actual breeding records have been made there, it seems likely that nesting might take place. The same set of circumstances prevails in Calaveras County where the birds are reported to arrive in the spring, stay through the summer, and leave in the fall (Belding, 1879). In Solano County there are established breeding records (Grinnell, 1927), and breeding seems to be of regular occurrence in favorable areas from this region southward.

In the Lower Sonoran desert regions breeding occurs wherever nesting sites and sufficient food are available. Records are at hand



(Above) WILLOW-SYCAMORE ASSOCIATION IN ALVARADO CANYON, SAN DIEGO COUNTY, CALIFORNIA. (Below) LIVE OAKS IN WHICH PHTHINOPHTHALMUS RESIDES, SAN DIEGO COUNTY, CALIFORNIA.

for Coachella, Riverside County (Clary), Twenty-nine Palms, San Bernardino County (Carter, 1937), Mecca, Riverside County (van Rossem, 1911), and the Lower Colorado River Valley (Grinnell, 1914). In addition, the author has studied a number of nesting pairs in eastern San Diego County.

The following records serve to describe further and to verify the material presented above concerning the distribution of the Phainopepla. Pemberton (1908) writes as follows:

*Phainopepla nitens* has been recorded along the foothills of the Sierras at various places north as far as Marysville, but previous to my observations the northern limit in the Coast Range was Mt. Hamilton where R. H. Beck noted one bird in November, 1899, and Ernest Adams also recorded a bird from near the same place on October 28, 1898. Joseph Mailliard reports having heard their note in Marin County, but has never seen a bird.

On June 23, 1907, while in the Arroyo Mocho in Southern Alameda County, I saw six of these birds which I took to be a family of four young and their parents. On April 1, 1908, near the same place I again saw a pair of Phainopeplas, but failed to secure either bird. Later in the year, however, while doing extended geological work in Arroyo Mocho I again met with the birds several times, and I believed several pairs to have raised broods this last summer.

Grinnell and Storer (1924) recorded the Phainopepla as resident in small numbers in the Upper Sonoran at the west base of the Sierras where it frequents the blue-oak belt, staying about clumps of mistletoe and other berry-producing plants. They found it at Pleasant Valley in May and November, 1915, and near Coulterville in August, 1920. No nests were recorded at Pleasant Valley. In a study of the Lassen Peak region, Grinnell, Dixon, and Linsdale (1930) mention a record of a single bird seen by W. P. Taylor on June 8, 1912, at Mill Creek.

NEVADA.—The occurrence of the Phainopepla in the desert regions of southern and western Nevada is certain. An early record of its presence is that of Ridgway (1877) who stated that he heard it on several occasions among the cedar and piñon woods of the desert ranges in western Nevada and saw it in the Soda Lakes region of the Carson Desert. Cottam (1936) writes as follows:

Linsdale writes that the northern limit of the Phainopepla (*P. nitens lepida*) in the state is not known. It may be reported that these birds frequented a small wild plum thicket in the town of Alamo each summer from May to September.

This last record would make nesting seem likely at Alamo. Coues (1878) states that it was secured by Mr. Ferdinand Bischoff in southern Nevada. Van Rossem (1936) makes the following observations in the region of the Charleston Mountains:

*Phainopepla nitens lepida* Van Tyne. *Phainopepla*. On July 19, 1932, a male phainopepla in parti-colored (one year old) plumage was collected in a pinon-juniper stand at Cold Creek. This individual was not breeding and we considered it to be a vagrant. Two adult males were seen in mistletoe-covered mesquites at Indian Springs on September 13, 1930. Fisher (1893) records the phainopepla as noted by Merriam at Mountain Springs on April 13, 1891.

We failed to find any evidence that the region is inhabited by breeding phainopeplas, or even that the species occurs in any numbers during migration; the few records are most probably those of vagrants.

UTAH.—The *Phainopepla* has been reported on several occasions from southern Utah and is apparently a breeding bird. Tanner (1927) records it from the Virgin River Valley and St. George. He records that it is a common summer visitant, breeding in May and part of June. Fisher (1891) reports it from the Santa Clara Valley between June 11 and 15, and states that several pairs were breeding at St. George. It is doubtful if the birds go far beyond this southwestern portion of the state and it seems safe to assume that they are found there only during the summer.

NEW MEXICO.—Bailey (1928) gives a very clear picture of the distribution of the *Phainopepla* in New Mexico and it is quoted here in its entirety:

State Records.—The southwestern part of New Mexico is the home of the small numbers of the *Phainopepla* that occur in the State, and here it is mostly rare and local. Doctor Henry says that in 1853 it arrived at Fort Webster on May 25, and nested on the Mimbres, but he saw none after July. It ranges commonly up the Rio Grande to Palomas Hot Springs and Elephant Butte. Fresh eggs were found at Elephant Butte, May 25, 1926 (Ligon, 1916–1918). Other records are those of one collected July 28, 1892, at Big Springs, Guadalupe Canyon, in extreme southwestern Grant County (Mearns); one seen August 17, 1908, at Silver City (Birdseye); one collected October 6, 1908, at Gila, 4,700 feet (Goldman); and one taken October 20, 1912, 20 miles east of Silver City (Kellogg).—W. W. Cooke.

It is evident from the above that the *Phainopepla* is by no means a common bird of New Mexico. The records which are available show that it is a breeding bird in the state, but the writer knows of no winter records. The few records mentioned are indicated on the map (Text-figure 1).

TEXAS.—Little can be said for the *Phainopepla* in Texas. Most authors state that its range extends into the west-central part of the state, but only one record has come to the writer's attention to indicate this. Coues (1878) reports that Mr. H. E. Dresser procured specimens at Eagle Pass, Texas.

ARIZONA.—Examination of the map (Text-figure 1) will show that the *Phainopeplas* are quite generally distributed through southern



and western Arizona. Swarth (1914) states that they are common summer visitants in the Lower Sonoran of southern and western Arizona and are reported from many points as far north as Fort Apache, Fort Whipple, and Fort Mohave. They remain locally throughout the winter in southern Arizona and along the Colorado River.

Three other references serve further to validate the distribution as given above. Coues (1866) wrote of the *Phainopepla*:

Summer resident, rather uncommon in the immediate vicinity of Fort Whipple. A little further south, however, it is found very abundantly, and is doubtless a permanent resident in the southern portions of the territory. It inhabits rather open country, in preference to densely wooded regions.

Scott (1888) has met with these birds at every point up to 5,000 feet in Pinal, Pima, and Gila Counties. He states that they are migratory except at Tucson and in the region to the southward and here only winter in small numbers. He believes they breed throughout their range. In the Catalinas they have been observed at 4,000 feet elevation and the earliest spring record is April 25.

The following records are from Swarth (1920) on the *Birds of Papago Saguaro National Monument and Neighboring Region of Arizona*:

Papago Saguaro Monument—Seen May 30 to June 4, 1917.

Tempe and surrounding farm lands—Seen May 30 to June 4, 1917.

Vicinity of Roosevelt Lake—June 5 to 11, and July 2 to 5, 1917.

Globe—July 5 to 7, 1917.

LOWER CALIFORNIA.—Grinnell (1928) summed up the distribution of the *Phainopepla* in Lower California as follows:

Varyingly common throughout the territory save on the higher mountains; permanently resident wherever found except that it is a scarce species in winter on the Pacific slope north to latitude 30°. Breeding lifezone, Lower Sonoran, locally Upper Sonoran; prefers the mesquite association wherever this is to be found. First reported by Baird (1859, p. 303, under name, *Phainopepla nitens*) as taken by Xantus at [San Nicolás near] Cape San Lucas [October 10, 1859] (see Baird, 1866, p. 416). There is no known island record for this bird. Published records from the mainland localities are so numerous that only a few are here given.

Grinnell includes a list of seven records and lists the localities represented by specimens in the Museum of Vertebrate Zoology, Berkeley, California. Bancroft (1930) states that these birds are plentiful in Jose Maria Canyon and progressively less so as one travels to the east. He found them absent locally from altitudes of over a thousand feet. Brewster (1902) found them resident in the Cape Region and

apparently about equally common at all seasons. He says that Anthony met with them from Ensenada southward, up to an altitude of 6,000 feet usually in mesquite thickets.

A number of interesting facts have been evident through this state-by-state discussion of the distribution of the Phainopepla. They are as follows:

1. Phainopeplas are generally resident in the Lower Sonoran regions of the deserts though their numbers are somewhat reduced in these areas farther north in the winter.

2. They nest quite commonly in the Upper Sonoran regions but are generally scarce or absent from such areas during the winter.

3. They are not found, except in rare cases, in the mountains, though they may be common in the foothills.

4. The records for northern and central California are mostly from the Upper Sonoran life zone and are of summer birds.

5. The records indicate in many cases a grouping or local abundance of the birds, with large areas in which no records were made, although there are ornithological reports from many such areas. Anyone who has studied these birds would expect just such a condition, as the birds seem to be limited by quite definite factors which will now be considered.

**HABITAT RELATIONSHIPS.**—The most important factor in the environment of the Phainopeplas is vegetation for it furnishes them with food, shelter, and a place to raise their young. Of all the plants the mistletoe (*Phoradendron*) is the most important, and on the desert the quickest way to find Phainopeplas is to first find mistletoe which grows so abundantly there on the mesquite (*Prosopis*) and ironwood (*Olneya*) trees. No less than fifteen references are available which make special note of this association. The Phainopeplas help in the distribution of the mistletoe for they eat the berries and the seeds pass through the digestive tract and cling to the branches below, where they germinate. Plate 8 (upper left) shows a whole clump of these seeds which accumulated under the perch of a Phainopepla. Such clumps are of common occurrence in the desert regions, especially during the winter when the birds do little but gorge themselves with mistletoe berries and then go to some favorite perch to digest them. These clumps can be seen at some distance and are indicative of an extended residence of the Phainopeplas. The fact that the birds so often use dead branches helps to save the trees from an overabundance of the mistletoe, for these branches break off, taking the seeds with them. If they do not break off they at

least give little to support growth of the mistletoe. The upper right and lower figures of Plate 8 illustrate the typical desert situations.

Grinnell (1914) in studying the birds of the Colorado Valley from Needles, California, to Yuma, Arizona, says that the Phainopeplas were closely restricted to two narrow belts along the river, one on each side, constituting the mesquite association. He says that the coincidence of the range of the bird with this association was "clearly due solely to the preferred food afforded in constant and abundant quantity by the berries of the mistletoe parasitic upon the mesquite." He believes that they would have availed themselves "of edible berries in whatever part of the region these might have been produced."

West of the mountains, quite a different association of plants is frequented by the Phainopeplas. No one plant is as influential as the mistletoe of the deserts. The willow (*Salix*), sycamore (*Platanus*), and live oak (*Quercus*) associations seem to be favored. Most of the observations made in western San Diego County have been in such areas (Plate 9). Often the birds were found in small side canyons in which scrub oaks (*Quercus*) and sumachs (*Rhus*) were found. For food in these areas the Phainopepla depended largely on elderberry (*Sambucus*), red-berry (*Rhamnus*), and pepper berries (*Schinus*). The birds are seldom found on open mesas, always showing a definite preference for canyons (Plate 10, upper figure).

Mistletoe occurring west of the mountains also attracts Phainopeplas but it does not serve as a limiting factor as it does on the desert. Grinnell and Storer (1924) found them in small numbers at the west base of the Sierra Nevada where they frequented the blue oak belt, staying about clumps of mistletoe and other berry-producing plants.

The Phainopeplas seem to have adapted themselves to changing conditions brought about by man. In many of the agricultural areas they have become quite common, nesting in orange groves and apricot orchards. Plate 10 (lower figure) shows a nest in an apricot tree at Lakeside, California. Woods (1932) in the *Condor* says:

Phainopeplas nest abundantly in the orange groves and orchards but are not attracted by fruit except berries, particularly those of the native buckthorn (*Rhamnus crocea*). They are however exceedingly addicted to the fleshy, sweetish petals of the Feijoa sellowiana or Paraguay Guava. These shrubs bloom profusely in early summer and companies of Phainopeplas constantly congregate about them.

More evidence of their tolerance of man is indicated by Bailey's (1922) report that they came to get water at a feeding station, several at a time. This record is of special interest as the writer has found

no reference of their coming to water other than this one, and has seen them bathe only once in the wild. This observation was made at Lakeside, California in the spring of 1940. They are most often found near water, probably because of the greater abundance of food to be found there. They also occur far away from water and hence must be capable of getting enough moisture from berries which they eat.

The relationship of the Phainopeplas to other animals is, for the most part, a friendly one. During the breeding season there is the usual evidence of competition for nesting sites, but this is far more keen among individual Phainopeplas than between them and other species. Of all birds the Western Mockingbird (*Mimus polyglottos leucopterus*) gives the most trouble throughout the year. Dawson (1923) says:

The Western Mockingbird not only plagiarizes the Phainopepla's notes most outrageously, but it seems to take a special delight in persecuting these timorous little mortals. Once in winter, I heard the round perp-note of a Phainopepla sounding from a clump of mistletoe, in a tall Cottonwood at Potholes. He had scarcely uttered his note three times when he was set upon and ousted by some enemy which I could not plainly see. Suspecting a Sharp-shin, I raised my gun and fired at the first show of form. I had intended to lay out the miscreant with a charge of 8's; but the wrong hammer struck, and from out the harmless shower of "dust" emerged a well-rebuked Mockingbird.

The following lists of common bird-associates of the Phainopepla were taken directly from my field notes:

Mission Gorge, San Diego County, May 5, 1935:

- Bush-tit (*Psaltriparus minimus*)
- Wren-tit (*Chamaea fasciata*)
- Lazuli Bunting (*Passerina amoena*)
- Western Lark Sparrow (*Chondestes grammacus strigatus*)
- Cedar Waxwing (*Bombycilla cedrorum*)
- Western Mockingbird (*Mimus polyglottos leucopterus*)
- Arizona Hooded Oriole (*Icterus cucullatus nelsoni*)
- Common House Finch (*Carpodacus mexicanus frontalis*)
- Western Meadowlark (*Sturnella neglecta*)
- California Towhee (*Pipilo fuscus crissalis*)
- Green-backed Goldfinch (*Spinus psaltria hesperophilus*)
- Brewer's Blackbird (*Euphagus cyanocephalus*)
- Northern Cliff Swallow (*Petrochelidon albifrons albifrons*)

Yaqui Wells, San Diego County, February 19, 1938:

- Western Mockingbird (*Mimus polyglottos leucopterus*)
- Northern Cactus Wren (*Heleodytes brunneicapillus couesi*)
- Gambel's Sparrow (*Zonotrichia leucophrys gambeli*)
- Gnatcatcher (*Poliophtila* species)
- Arizona Verdin (*Auriparus flaviceps flaviceps*)

Yaqui Wells, San Diego County, April 2, 1938:

- Common House Finch (*Carpodacus mexicanus frontalis*)
- Plumbeous Gnatcatcher (*Poliophtila melanura melanura*)
- Arizona Verdin (*Auriparus flaviceps flaviceps*)
- Costa's Hummingbird (*Calypte costae*)
- Black Phoebe (*Sayornis n. nigricans*)
- Gambel's Sparrow (*Zonotrichia leucophrys gambeli*)
- Western Chipping Sparrow (*Spizella passerina arizonae*)

Mason Valley, San Diego County, April 15, 1938:

- Western Flycatcher (*Empidonax d. difficilis*)
- Western Mockingbird (*Mimus polyglottos leucopterus*)
- Valley Quail (*Lophortyx californica vallicola*)
- Gambel's Sparrow (*Zonotrichia leucophrys gambeli*)
- Black-throated Gray Warbler (*Dendroica nigrescens*)
- Bullock's Oriole (*Icterus bullocki*)
- Costa's Hummingbird (*Calypte costae*)
- Arizona Verdin (*Auriparus f. flaviceps*)
- Northern Cliff Swallow (*Petrochelidon a. albifrons*)
- Golden Pileolated Warbler (*Wilsonia pusilla chryseola*)
- Road-runner (*Geococcyx californianus*)
- California Towhee (*Pipilo fuscus crissalis*)
- Barn Swallow (*Hirundo erythrogaster*)
- California Thrasher (*Toxostoma r. redivivum*)

Alvarado Canyon, San Diego County, April 30, 1938:

- Western Mockingbird (*Mimus polyglottos leucopterus*)
- Dwarf Cowbird (*Molothrus ater obscurus*)
- Golden Pileolated Warbler (*Wilsonia pusilla chryseola*)
- Calaveras Warbler (*Vermivora ruficapilla ridgwayi*)
- Hutton's Vireo (*Vireo h. huttoni*)
- San Diego Wren (*Thryomanes bewicki correctus*)
- Black-headed Grosbeak (*Hedymeles m. melanocephalus*)
- Western Flycatcher (*Empidonax d. difficilis*)
- Bullock's Oriole (*Icterus bullocki*)
- Western Tanager (*Piranga ludoviciana*)
- Western Meadowlark (*Sturnella neglecta*)
- Western Wood Pewee (*Myiochanes r. richardsoni*)
- Coast Bush-tit (*Psaltriparus m. minimus*)
- California Towhee (*Pipilo fuscus crissalis*)
- Tule Yellowthroat (*Geothlypis trichas scirpicola*)
- San Diego Towhee (*Pipilo maculatus megalonyx*)
- Green-backed Goldfinch (*Spinus psaltria hesperophilus*)

These birds occupy the same general areas as the Phainopepla, many feed upon the same type of food, and nest in the same bushes and trees, but, except for the Mockingbird, little friction is evident among them. The fact, however, that they do all occupy the same area is undoubtedly a factor in limiting the number of Phainopeplas.

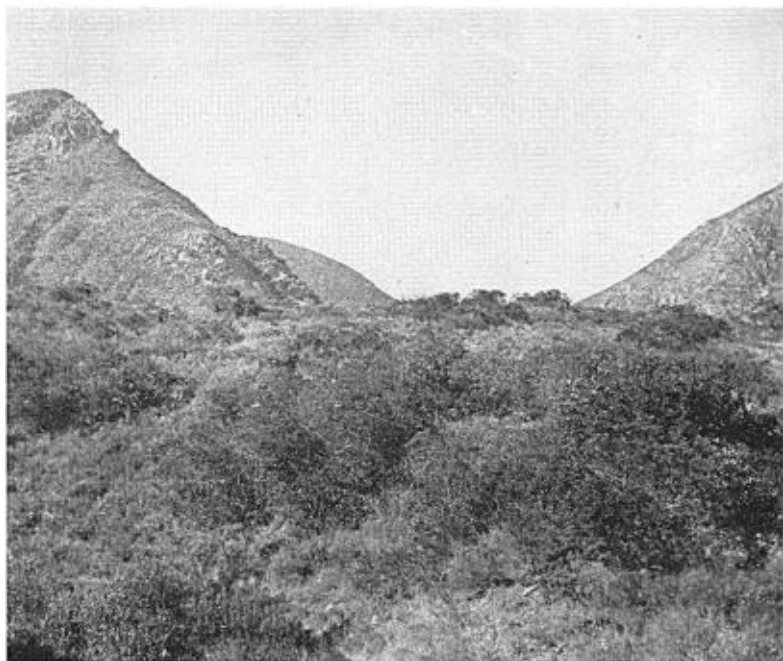
The Dwarf Cowbird should be listed as one of the enemies of the Phainopeplas for it is known to lay eggs in their nests, leaving them to be hatched and the young to be cared for by the Phainopepla. Friedmann (1931) says:

Rowley (*Condor*, 1930, pp. 130-131) found a nest of this bird containing a young Dwarf Cowbird as well as a young Phainopepla. This is the second record for this bird as molothrine host.

*Migration.* The migration of the Phainopepla is a problem which will take many years to solve. Before any answer can be found, hundreds of birds in all parts of the range must be captured, banded, released, and then recaptured. While banding activities have been carried out by the Biological Survey of the United States Government for many years, no Phainopeplas have been banded. The greatest obstacle in the way of such a study would be the capture of birds in Mexico where there are few, if any, banding coöperators. Also the vast, uninhabited regions in Mexico would be hard to work.

Regardless of all these problems, certain rather definite conclusions can be drawn concerning the migration of the Phainopeplas. In the author's field notes there are spring-arrival records for April 21, 1934; April 15, 1935; May 3, 1936; and April 30, 1938—all seen in San Diego, California. Similarly it has been found that they begin to disappear from San Diego in August and are not common thereafter until the next spring. On October 4, 1936, they were recorded in East San Diego. Like records have been presented in the previous discussion for other parts of the state west of the mountains. All of these records point to a northward migration in the spring and a southward migration in the fall. This migration seems to be complicated by a movement of birds from the deserts of southeastern California presumably into the cooler climates to the north and west. This exodus of the birds from the desert, when it occurs, follows the breeding season along in late April or May. All individuals do not leave and in some areas apparently none. Dawson (1923) says of this migration:

The desert-wintering birds remain to breed in late February, and in March; and then in April migrate to the cooler sections of the state, west and north. Whether these desert-nesting birds breed again when they arrive at their summer home, we do not know; but it is more probable that they remain as a non-breeding element in the local summer population. The bulk of the birds coming from directions and places unknown, irregularly invade the western portions of southern and central California about the middle of April, with fresh accession of numbers up to June 1st. They abound in the San Fernando and neighboring Valleys, clinging, rather fatuously, to the dwindling desert washes, although they appear to be relatively less common in San Diego County.



*(Above)* PHAINOPEPLAS FREQUENT THE SUMACHS ON THE CANYON SIDES; MISSION GORGE, SAN DIEGO COUNTY, CALIFORNIA. *(Below)* FEMALE PHAINOPEPLA NEAR NEST IN APRICOT TREE; LAKESIDE, SAN DIEGO COUNTY.

After noting the disappearance of the birds from the desert in the spring of 1938 without breeding, it occurred to the author that possibly these were the ones which came into the foothills, north and west. In San Diego County my experience has shown that the *Phainopeplas* which come west of the mountains do nest, at least the majority of them do. It is not logical to suppose that they would nest on the desert, migrate, and again nest as Dawson (1923) suggests. Perhaps each year there are some birds which fail to nest on the deserts either to the south or east and they are the ones which come into areas such as San Diego.

The migration in the late summer and fall is as evident as that in the spring, and the problem is somewhat the same. Do the birds move only to the south or do they move across the mountains to the east? An increase in the number of desert individuals would indicate the latter. Records which have been presented in the discussion of distribution make it sound plausible that the birds may cross the mountains. Birds occurring in the Los Angeles area and to the northward, up the coast through San Luis Obispo, Salinas, and San Jose, could easily move to the Colorado Desert by way of San Bernardino, Beaumont, and Banning without going over any high mountains. In San Diego County the author has seen birds at Warner's Hot Springs which is the highest point they would need to reach in travelling from San Felipe, Borego, or Mason valleys to the foothills west of the mountains. Such migrations could be made over the mountains without leaving the Upper and Lower Sonoran life zones. Therefore, as far as topography is concerned, there is no good reason why *Phainopeplas* should not move from one side of the mountains to the other. Only banding, of course, can prove this beyond a doubt.

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## BREEDING NOTES ON THE PHAINOPEPLA<sup>1</sup>

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IN Mrs. Bailey's ('Birds of New Mexico,' p. 595, 1928) sketch of the breeding habits of *Phainopepla nitens*, she comments on the variety of its notes, and implies that its melodious song is a conspicuous feature of the bird. She goes on to say that the male often assumes the duties of the female, building the nest and brooding the eggs, while the female flies about with her sisters awaiting the time to care for their young.

Crouch (Abstracts of Dissertations, University Chronicles Series, University of Southern California Press, Los Angeles, 1939), in a summary of his work on the *Phainopepla* in California, says that the song of the male is somewhat subdued and is heard chiefly during the establishment of territory, acquisition of a mate, and nest building.

<sup>1</sup> Contribution from the Archbold Expeditions of the American Museum of Natural History, New York City.