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DISCOVERY OF THE NEST AND EGGS OF THE TUFTED JAY

WITH FOUR ILLUSTRATIONS

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Ever since the description of the Tufted Jay, *Cyanocorax dickeyi* (Auk, vol. 52, 1935, pp. 274-277), the author has hoped to find the nest of this fascinating new species. In April, 1936, a party was organized to spend two weeks at the type locality, Rancho Batel, southeastern Sinaloa, under the belief that at this period of the year we would find the Tufted Jays nesting. Beside the author and his wife, the party consisted of Mr. and Mrs. Paul G. Austin, Chester C. Lamb, and a Mexican assistant, José. That this undertaking failed to attain its chief objective was not due to any lack of energy. Considerable areas of an exceedingly difficult mountain range, dissected into steep-sided arroyos and one stupendous barranca, were covered by members of the party. Throughout this period only one small flock and three individual jays were observed. Obviously they were just beginning to feel the urge of an approaching mating season. Dissection of the sexual organs indicated that the birds were not breeding and forecasted a nesting season beginning about the middle of May. As it was impossible for the party to remain another month, the undertaking was abandoned.

Early in 1938 it once more became possible to plan a zoological excursion to southeastern Sinaloa, and early January found the author working on the numerous difficulties of obtaining collecting permits, arrangements for assistants and new photographic equipment that was required by the advancing technique in color films. Mr. Arthur Barr of Pasadena was a new acquisition to our increasing and friendly party of bird students. He proved an extremely valuable and indefatigable co-worker in the photographic program, as well as in studies of life habits of the denizens of this mountainous region.

On May 15, 1938, with our old companions, Chester C. Lamb and José, we were heading for Rancho Batel and the exceedingly restricted habitat of the Tufted Jay. Although we had just spent a most eventful week photographing sea birds, secretly we knew we would judge the success of our expedition chiefly by one criterion: would the nest of *Cyanocorax dickeyi* become known to science or not?

By the twenty-first of May, I was sitting on a moss-covered log in a mixed growth of pine and oak on a spectacular mountain range, where it begins to drop steeply to the Pacific Ocean, fifty miles to the west. Epiphytes and parasites covered the moss-festooned branches of the oaks, which arched out and down over the precipitous slope. A cluster of fragrant wine-colored orchids focused my attention on an arm of a mighty oak. Would the Tufted Jay choose such a luxuriant surrounding of moss, tree ferns, bromelias and orchids for its nesting site? Through the arching limbs could be seen the seared slopes of dry brush of the upper Arid Tropical Zone far below, from which crept up along an arroyo to the right a ribbon of heavy tree growth. These trees belonged to a different floral zone than that of the pine-oak association, in which I was sitting. Clearly I was ensconced on the dividing line between two zones. That the world behind me had little to do with the world below was quickly indicated by a two-noted, staccato call from the heavily laden oak limb above. A Chihuahua Ptilogonys (*Ptilogonys cinereus otofuscus*) was seriously objecting to my presence and summoning his duller-colored

mate to discuss the unwonted intrusion. The call note of a Sierra Madre Creeper (*Certhia familiaris albescens*) called attention to a bird near a nest in the cracked bark of a pine tree. To my right a female Hepatic Tanager (*Piranga flava oreophasma*) was examining an oak crotch with great care, seemingly interested in the possibilities of a nest site; and now from the vine-draped growth along the arroyo to the west came the high-pitched, ethereal song of the Jalisco Solitaire (*Myadestes obscurus occidentalis*)—a series of musical slurs of great range, but of faint and ventriloquistic quality. Surely these birds belonged to the Transition Zone. But only this morning a Chachalaca (*Ortalis vetula*) had made his song, that resembles the creaking of rusty springs, crackle over the brush. And a Blue Mockingbird (*Melanotis caerulescens effuticius*) had touched the zenith of a memorable morning by his full-throated songs from the blackberry brambles.

Would the Tufted Jay choose such a site for its nest or would it prefer the solid pines on the top of the range behind me? Instantly the answer seemed to come to my question. Two gleams of dark blue and white flashed through the great oak. The Tufted Jays had arrived. Greatly different from the mischievous carefree creatures of our April days of 1936, this pair was engrossed in a serious job. They hopped from one clump of orchids to another; they stayed long in a mass of tree ferns, clearly searching for something they could not find. There was no mistaking them. That snow-white tail could belong to no other bird than *Cyanocorax dickeyi*. And then, suddenly, a pair of ptilonysses became aware of them and fell upon them, like kingbirds upon a hawk. In a moment bedlam was let loose. It seemed as if every bird of the forest had come to the attack; from all quarters they swarmed upon the pair of jays. Solitaires, White-eared Hummingbirds (*Hylocharis leucotis leucotis*), Mexican Thrushes (*Turdus assimilis renominatus*) and several species of flycatchers, felt it incumbent upon them to express their dislike for the intruders. Although the din did not cease until the jays had disappeared along the rim to the northeast, the bedeviled birds paid little attention to their annoyers, except to dodge, when a ptilonyss, more furious than the rest, dived too close for comfort.

While I was waiting for their return, I scanned with my binoculars a thick mass of vines and dark umbrage near the top of the heavy growth by the arroyo to the west. There right before my eyes and not fifty feet away on the moss-decked tree was the crouching form of a Tufted Jay. Its wings were slightly spread as if hovering over a nest! The end of my search seemed to have been reached. But an examination of the tree proved that the peculiar attitude was due to the ferns and orchids in which the bird had crouched. There was an old nest nearby, which might have been used the year before. On return to camp it was learned that Arthur Barr and Chester Lamb had seen eight Tufted Jays near the camp, but had discovered no nests.

Three days past without seeing a single Tufted Jay. The top of the mountain range had been thoroughly gone over for two miles in all directions, and so conspicuous a bird could hardly have escaped observation by three watchful ornithologists. We began to doubt that the birds were nesting in the Transition Zone at the top of the range, or even in the oak-pine association of our camp. Were we too high? My barometer gave the altitude as 5640 feet and the top of the range as 6000 to 6200 feet. Rudolpho had reported that Tufted Jays were more numerous in a region about a day's journey away, or approximately ten miles along the range to the northwest, but he was vague as to the exact locality and type of tree growth. We determined to concentrate our attention on the slopes below us, particularly on the east side of the range where oaks and other high trees were concentrated along water courses.

On May 24, José came in with the calm statement that down on the eastern side, where the Durango and Panuco trails forked, he had seen four Tufted Jays and found two old nests, as well as one which had the appearance of being new. In the afternoon José and I climbed over the range, and soon we were dropping down rapidly on the trail to Durango City. About five hundred feet below the summit, where the pines had ceased entirely, we reached the head of an arroyo, which descended in a northeasterly direction. It made a noticeable depression in the eastern slope of the range. To the right of it was a considerable stand of oak trees, of a totally different character from any we had observed elsewhere. These were seventy-five feet or more in height, the trunks slender, and practically all the branches vertically upright so that the parallel upright shoots formed a flat top. After leading me for a quarter of a mile through the dense forest, José pointed straight upwards. So thick were the limbs and so dark the gloom, that for several minutes I could not locate the nest of sticks at the very top of one of the tallest trees. Then came from an adjoining tree the unmistakable jay call, with which I had become familiar in 1936 (call 1, fig. 61). A moment later a flash of white and dark cyanine blue caught my eye in the top of one of the nearby trees. A glance through my binoculars revealed that a tufted head was cocked sidewise and golden eyes were examining me intently. Soon the mate appeared, and then a third bird, a fourth, a fifth and a sixth. Although they were on the best of terms and obviously interested in each others affairs, a tendency was evident to keep in pairs. José assured me that the sticks had been placed recently and, as if to prove his assertion, one of the jays flew to the tree and gradually hopped up within ten feet of the nest. A terrific crash of thunder interrupted our observations and the jays vanished as suddenly as they had appeared. Soon hail was slashing the oak leaves and the white bullets stung us as we crouched under the slanting trunks of an enormous madroño. During a lull in the storm, José climbed the tree, and within 15 feet of the top gave an exclamation of disgust; the nest was "viejo."

Disappointed, we started for camp up the long slope. Reaching the margin of the oak forest, I was suddenly galvanized by the sight of a jay picking at a twig. A quick glance through the binoculars proved that it was actually seizing bits of twigs and breaking them off. With a half dozen in its bill, it flew to a concealed oak top. Creeping over, I caught sight of a brand new nest far up in the oak, about fifty feet from the ground. The tufted dandy was actually weaving twigs into it. Our excitement was great at finding the first nest and it required real control to leave the vicinity at once in order not to frighten the birds from laying eggs.

No further Tufted Jays were seen until May 28, when in the middle of the afternoon Rudolpho, who had been assiduously hunting them, came in with the report that he had found a nest. He had seen a bird sitting on it. As he assured me it could be reached in less than two hours, I decided to go at once. It had been a gray day of swirling fog, which had started off inauspiciously. I secretly feared he had mistaken *Cyanocitta* for *Cyanocorax*, the former being present, though rare, in this locality. With enthusiasm renewed, we started straight up the precipitous slope of the range and in a half hour were slipping and winding down the exceedingly steep trail on the other side through a very different type of country. I was confident we were headed for the same arroyo, whose source was close to the first nest we had found on the twenty-fourth. But we veered farther down the mountain side into the lower reaches of the arroyo, where a narrow valley was filled with a luxuriant tree growth. In an hour we were picking our way beneath large trees of various species in a gorge, where deep pools of water were responsible for the rank undergrowth. Out of its depths sprang a magnificent magnolia, thirty feet in height, covered with huge white buds and flowers. They were deliciously fragrant, without the pungent

quality of our eastern magnolias. Still farther down was a cluster of small fern-like palms, perhaps fifteen feet in height, grouped on a mossy bank. A warning finger from Rudolpho stopped us short. Instantly my eyes caught sight of a bulky nest of sticks in a tall tree, which bore a faint resemblance to an eastern elm. Its top was twenty feet higher than our location on the side of the little gorge, but its roots were thirty feet below us near one of the pools, and the nest was placed in the very top of this tree. I confess that a thrill of excitement went up my spine when I noted through my binoculars the familiar erect crest of separated tufts and the chrome yellow eyes looking dreamily over the side, apparently unconscious of our arrival. A slight slip of my foot brought the bird to instant alertness. Here was the vibrant personality I had become acquainted with in 1936. As she remained at her post of duty, vigilant but poised, we relaxed and enjoyed the rare sight.

When I rose to determine the best way of photographing her, she did not instantly fly, but eventually disappeared quietly up the gorge, where she was later joined by her mate. The birds were very quiet at first, and even later, when conscious we had discovered their nest, they did not give way to raucous outcries, characteristic of most jays. In fact their loudest call (call no. 1) was given only once during the three days of our acquaintance with this particular pair. This call has a rather harsh staccato quality, but the most common call has a much higher pitch and sharper quality, the notes repeated rapidly (call 2, fig. 61). Four other call phrases were heard, either from this pair or others discovered later. No. 3 is an alarm note of clucking quality, which is given more than any others. No. 4 possesses a peculiar, plaintive quality, not scolding but rather conveying a sense of uneasiness. Calls 4 and 5 were the only ones whose notes were not sharply staccato. The accents, which are given in the notation, were conspicuous. No. 5 was a very musical and low-pitched call, and 6 was a longer version of no. 3. With all these varied expressions, the Tufted Jay cannot be classed as a noisy protester. It is decidedly concerned about its nest and will brave almost any danger to voice its objection to intrusion upon its privacy.

I. *ff* 4 notes to 1 second Ca-Ca-Ca-Ca-Ca-Ca-Ca-Ca

II. *f* It-i-ty, It-i-ty

III. *ff* Tut Tut

IV. *mf* Presto

V. *ff*

VI. *mf*

Fig. 61. Call notes of the Tufted Jay (*Cyanocorax dickeyi*).

The nest is large, the size of a crow's nest. Made of sticks, its lining, as we learned later, consists of fine and much twisted rootlets. Approximately two feet in diameter, it was not placed in a solid crotch, but woven among the slender branches of the very top of the tree. Clearly it was impossible to get within ten feet of it by direct climbing, without danger of breaking either the eggs or the limbs of the climber. The main trunk of the tree sloped horizontally across the gorge and the trunk on which the nest was

built was merely one of the side branches which grew straight into the air. By following the main trunk about thirty-five feet it was possible to reach the upright column of another tree and thereby climb above the nest for a view into it. I shall never forget my first sight of the four eggs partly hidden by the leaves of the branches.

Still another tree was used as a support for a blind, from which we photographed the nest on the following day. This tree was a real giant, perfectly straight, seventy feet in height, with a large crotch immediately opposite the nest and not more than twelve



Fig. 62. Tufted Jay at nest; Rancho Batel, Sinaloa, Mexico.

Photograph taken by Arthur Barr.

feet away from it. For two days Arthur Barr and I photographed in three-hour shifts from the blind in the top of this tree. On the last day I tied the limbs of the two trees together tightly, swaying them toward each other, in order to make it possible to swing out on a loop of webbing and secure the eggs.

The inside measurements of the nest, which was brought back to the United States in good condition, are six and a half by five inches, and the bottom is deeply cupped, being three inches deep. If it had not been for this ample depth, the eggs could never have been secured by the dangerous "tipping" process which was employed.

Although only four eggs were noted on May 28, another egg must have been laid that night, because five were observed on the next day. This seems to be the normal clutch, as five young were found in another nest on May 31. The eggs measure in millimeters: 37.1×25.4 , 36.0×24.4 , 36.4×24.8 , 35.9×24.4 , 38.2×24.0 . When fresh, they possessed a slightly bluish olive-white ground color, which rapidly faded to pale olive-buff. Rounded at both ends, they are spotted with Sayal brown and bister, and obscurely blotched with lavender gray. Spots and blotches are scattered all over the egg, somewhat less on the sharper end, and the coloration is very uniform.

The habits about the nest proved to be more than usually interesting. Not only were both birds extremely courageous, one occupying the nest within a half hour after the noisy building of a ground blind on the bluff not twenty feet away, but both birds came together and actually squeezed into the nest, sitting on the eggs side by side, so that their crests were parallel. In about three minutes one of them seemed to get uncomfortable and was finally squeezed out of the nest by the other bird, so that the ejected one was forced to sit on the rim, where it remained for a long time. Unfortunately, from our position on the ground, we could obtain pictures only of the latter bird, which we assumed was the male. A few minutes later he retired to a limb five inches away from the nest and clucked to the supposed female. When they were side by side on the eggs, I distinctly saw one bird caress the bill of the other.

Even more remarkable, was the fact that a third bird flew up to within five feet of the nest while the first two were on it. This bird's presence did not seem to be resented by either member of the pair. In this connection, Arthur Barr, while occupying the tree-blind alone on the following day, observed an interesting incident. He has permitted me to quote from his notes:

"While the female sat on the eggs, the male was perched less than twenty feet from the nest, making up to another bird. They gently picked at each other's feathers and



Fig. 63. Tufted Jay incubating.

Photograph taken by Arthur Barr.

seemed to concentrate on the head. It appeared as love making and was accompanied by low clucking sounds. After a while the new bird flew down the canyon and the male followed. . . . I jerked the rope and she [the bird of the nest] flew away down the canyon. About fifteen minutes elapsed before she returned, and the male was with her. They both went to the nest and, when the female was settled down, he left and, as he flew down the canyon, the third bird left a tree across the canyon and flew with him." It

is conceivable that this may be a case of "mutual helpfulness" such as Skutch (Auk, vol. 52, 1935, pp. 261-265) has described in *Psilorhinus mexicanus cyanogenys*, but if so, we did not see the complete picture.

The mated birds seldom stayed away from the nest more than a half hour at a time and, when they arrived, promptly went on to the eggs. In fact, one bird, presumably the female, often flew straight to the nest from a long distance, landing on its edge, without first perching on a single intervening limb. Occasionally she would appear on a tree some thirty feet away and peer around a branch at the blind, each time swaying her beautiful body and neck in the most graceful attitude imaginable. Always conspicuous because of the large immaculate white tail, her blue wings and upper parts, almost black crest and white facial marks made her an outstanding object. Even when I built the blind on May 30 at the top of an adjoining tree, not over twelve feet away from the nest, the noisy preparation did not frighten her severely and she was back in a half hour sitting on the eggs. When once comfortably settled down, she could not be moved by ordinary methods, such as calling or even by shaking the blind. It was invariably necessary to shout to some assistant on the ground and have him throw a stick toward the nest.

On May 31 Rudolpho and I started for a new nest, which he claimed to have found about a mile away from nest no. 2. It proved to be located in the same grove where nest 1 was found, and only about a hundred yards from it. Although the bird was actually sitting on the nest, so thick was the foliage about it and so high was it placed in the tree, that I could not see any portion of the bird with binoculars. Nevertheless, when the tree was shaken, the parent left the nest. Although in the same large grove of the peculiar straight oaks, this tree belonged to a different species which I could not identify. Like all the others, the nest was in the very top of the tree and the branches were so small that climbing through them would have been exceedingly dangerous. I reached a point fifty feet above the ground, fastened a rope to the trunk and then, with the other end of the rope attached to my belt, hitched up a tall pine tree nearby. There was not a good limb for fifty feet and the ascent without climbers or belt proved arduous. Reaching a good limb fifty feet from the ground, I rested and was able to pull the nesting tree toward me and discover five young birds in the nest. The young were about three days old and without feathers. They gave a slightly nasal call and raised their heads for food when I lifted them out of the nest. We did not put the blind in the pine tree until June 3, by which time the rectrices were already beginning to develop, being nearly an inch in length and showing a distinct blue color. Therefore, the length of these feathers was attained in four days of growth.

During the entire operation of putting the blind in the pine tree, one of the jays, presumably the female, stayed directly overhead in the tree, often not more than three feet away. Scolding constantly, but in a rather subdued tone, she seemed intensely curious about the house that was going up within ten feet of her own. Not once would she go to the nest. As she knew all about the intimate details of the blind, it seemed foolish to put a ceiling on it. Consequently, when the sides were draped around and I was permanently seated on the tiny piece of board near the crotch, I assumed the bird would eventually go to its nest and feed the young. She had no intention of doing this, for in a half hour's time a flutter was heard and she appeared directly above my head, and with a "ca-ca-ca" announced that she had discovered me and was not to be fooled. I tore off the bottom of the draping of the blind and pieced together a ceiling. In an hour's time she was back and trying to look through the crevices. Not satisfied, she actually sat on the edge of the cloth and pulled at it, trying to peek through the interstices.

Eventually, about an hour later, she went to the nest and fed the young. After starting my moving picture camera, I tried to stop it at the end of five feet, but the button was caught so that it kept on whirring. Looking up, I was astounded to see two jays within the field of my camera, one on each side of the nest and each one feeding a young bird. In spite of the foggy atmosphere, the photograph came out better than I could have expected and is a moving testimony, not only to the boldness, but to the devotion of these remarkable parents.

Rudolpho brought in two young jays about four weeks old on May 29, stating that he had secured them out of a flock of eight, which were flying about the trees, a day's journey to the north of us along the ridge. Further questioning indicated that they



Fig. 64. Nest and eggs of the Tufted Jay.

Photograph taken by Arthur Barr.

probably belonged to two separate groups of four young each. One of them died the same night, but the second is still living (June 25, 1938). As this is the first immature bird that has been secured, a description will not be out of place. Resembling the adult birds in most particulars, it differs in having the rectrices almost entirely white, with the exception of the median pair which is blue at the base for a half inch. The white patch over the eye is missing, being replaced by black; and the large white patch below the eye is replaced by black and blue, the posterior portion being black, and the malar region bluish-black in one of the young and cyanine blue in the other. The most remarkable difference appears in the crest. The conspicuous and long black tufts of the adult are replaced by short stubby tufts, the forepart of these being very stiff as in the adult. The middle crest on the top of the crown is also black and softer, but is so short that it does not extend very far behind the eye. The young bird can move this black crest slightly, but cannot depress it. It has much more power over the white feathers on the extreme posterior part of the head, which it can raise into a conspicuous crest, or lay

completely flat. It moves them frequently. I never saw the adult birds move this white portion on the posterior part of the head, nor did I ever see them raise or lower the tufts of the black crest. I am convinced that it is a permanently erect crest, although it may be moved slightly.

The food is greatly varied. In April of 1936 a stomach was examined and was found to be completely filled with broken pieces of kernels of acorns, none of them more than a quarter of an inch square. In May and June of 1938, such food was difficult to obtain. The Indians state that at such times these birds not only feed on the larvæ and the sweet combs of wasps' nests, but also devour quantities of wild blackberries which are found in every open place on the range. The immature bird seemed to like blackberry juice and was exceedingly fond of insects, wood worms and grubs. It was most avid for the larvæ and eggs of a wasp's nest, which I secured. It could be persuaded to pick at the kernels of canned corn, but it soon tired of this food. This young bird has proved an interesting and extraordinarily intelligent pet.

The fact that birds, four weeks old, were found on the same date that fresh eggs were taken, proves that the nesting season is a long one and probably lasts from the middle of April to June 15. A number of old nests and a total of four occupied nests were found by the expedition. One of them was discovered by Rudolpho high up on the shoulders of Aguila Peak, a mountain mass that rose at least 500 feet higher than our part of the range and which was situated almost due east of us. Although it contained eggs the day Rudolpho found it, they had disappeared on the following day when I went with him to the nest.

It should be noted here that the plate (*Auk*, vol. 52, 1935, opposite p. 274) accompanying the original description of this jay is incorrect in one detail. At that time the color of the eyes was not known and was assumed to be brown. After the article was published, a jay was secured at Rancho Batel and its eyes proved to be chrome yellow, having a very beautiful metallic golden effect. Eyes of some specimens have not quite so rich a yellow.

It cannot be said that the habitat of this jay is very extensive. Only at one place other than Rancho Batel has Chester Lamb, or any member of our expeditions, taken it, and that was near the headwaters of the Presidio River, a region about twenty-five miles northeast of Rancho Batel. Another specimen has been secured recently in the same general area and is now in the collection of the Academy of Natural Sciences, Philadelphia. This jay will be found without question in other localities, probably to the east in Durango.

California Institute of Technology, Pasadena, California, June 25, 1938.