

effective isolating mechanisms. Therefore, I now believe that if contact between populations of the two forms of *Rhynchopsitta* were established, they would not interbreed. I thus recommend that *R. pachyrhyncha* and *terrisi* be regarded as full species. I wish to point out that this opinion does not represent that of Dr. Dickerman, probably owing mainly to the fact that he has not read my paper upon which this conclusion is founded.—JOHN WILLIAM HARDY, *Moore Laboratory of Zoology, Occidental College, Los Angeles, California 90041, 1 October 1966.*

The Temporary Establishment of Dominance between Two Hand-Raised Juvenile Cactus Wrens (*Campylorhynchus brunneicapillus*).—Two nestling Cactus Wrens, aged 13 and 14 days, were removed from different nests and hand-raised together. Eight days later, when they were placed together on a table, as was customary, for feeding in the morning, they began to fight vigorously. They were facing each other, sitting well back on their tarsi with their wings outstretched as props, grasping with their feet and pecking hard with their bills. The younger bird (Red) clearly had the advantage over the other (Blue) from the outset. During the fighting Blue was pecked hard and often and made loud cries, but Red made no noise. When they were pulled apart, Red pecked hard at Blue's back and head. After a second separation, Red pulled at Blue's tail feathers, and Blue in turn did the same to Red. Fighting continued in this manner whenever the birds were together throughout most of the morning.

When the young were observed carefully again at noon, Blue had become markedly submissive to Red, who in turn had become very aggressive and dominant. In the presence of Red, Blue generally crouched low, with its belly and breast touching the table top. Its tail was kept down, and its head was drawn back with the bill pointing slightly above the horizontal. The wings were folded close into the body. Occasionally Blue gave cries, similar to those of begging juveniles, while in this posture. No quivering of the wings or body was noted, and Blue made no attempt to flee. Once when Red was not looking, Blue pecked at his body. Red then turned and attacked Blue who defended for about five seconds and then adopted the submissive crouch.

Red's reaction to the submissive crouch was at first to peck Blue on the head and back. Later, Red would stand over Blue and peck lightly and only at Blue's bill. Often, Red would stand quietly on top of Blue's back, occasionally autopreening, or else completely ignore Blue.

The birds were separated early that afternoon, but when placed back together that evening they were amiable toward each other and remained so for the remaining four days that they were kept.

In summary, fully developed agonistic behavior was observed between two hand-raised birds from different nests at 21 and 22 days of age (1–2 days after they would have fledged normally). One was clearly superior from the beginning, and within three hours the other had adopted a submissive behavior when in the presence of the now-dominant bird. The birds were then separated for about five hours after which no antagonism was noted between them.

These observations indicate a propensity, in this species, for the rapid development of dominance/subordinance relationships among fledglings which may facilitate cohesion within the family group. In the Cactus Wren, as well as other wren species, the family group is maintained for a long period of time and is spatially very close-knit.—ROBERT E. RICKLEFS and F. REED HAINSWORTH, *Department of Biology, University of Pennsylvania, Philadelphia, Pennsylvania 19104. (Present addresses: Smithsonian Tropical Research Institute, Box 2072, Balboa, Canal Zone and Department of Biology, Duke University, Durham, North Carolina.) 16 November 1966.*

A Case of Classical Conditioning in Nestling Cactus Wrens.—In April 1966 I fitted several Cactus Wren (*Campylorhynchus brunneicapillus*) nests in the vicinity of Tucson, Arizona, with counters to record visits of the adults. The nest is roughly flask-shaped with the entrance to the side. A trip-bar, within a wire mesh collar, was positioned in front of the entrance of each nest. With this arrangement, an adult had to perch briefly on the bar before entering the nest. The bar was attached to a relay which triggered a battery-operated event counter. Note that the adult had to perch on the bar before feeding the young, and that the counter made a rather loud click.

In removing young from a nest for measuring and weighing, I occasionally tripped a counter by accident. One morning this happened at a nest (F) that contained five young, ages 7 to 8 days. (The normal brood size is three or four, but I had placed an additional nestling in this nest.) The young started to beg loudly, which is a difficult response to elicit from this species in the nest. I purposely pressed down on the bar several times, each time obtaining the same response. I also tried waving my hand in front of the nest, produced noise and vibration by tapping the wire collar and the nest itself, and stuck my hand into the nest without touching the young, but none of these actions caused begging. When the battery was disconnected, pressing the bar failed to elicit the begging response. These experiments were repeated several times that day with the same results. I tried the same at two other nests, one with four young, five to six days old, and another with three young, 10 days old, but no responses were noted. On the other hand, in one nest with four young, five days old, weak begging responses to my presence and disturbance were noted three times that day. But these consisted only of gaping and were not accompanied by begging cries. Also, it was noted at nest F later that afternoon that a few of the young would beg at my approach. Early the next morning I noted that the response was still strong. But after I had removed the young for measuring and weighing and replaced them, I was not able to elicit begging by pressing the bar. Observations were not carried beyond this point except to record that all five young fledged successfully at ages 20 to 21 days.

It must be concluded that the nestlings were conditioned to beg when hearing the noise made by the counter. Usually this would immediately be followed by the appearance of an adult with food. Normally, the young beg when the adult appears. That this response was conditioned to a related stimulus only in the one nest with the abnormally large brood suggests that the conditioning was enhanced by competition among the nestlings for the food brought by the parents.—ROBERT E. RICKLEFS, *Department of Biology, University of Pennsylvania, Philadelphia, Pennsylvania 19104.* (Present address: *Smithsonian Tropical Research Institute, Box 2072, Balboa, Canal Zone.*) 16 November 1966.

Nocturnal Feeding of *Sterna fuscata* and *Puffinus pacificus*.—On the night of 4 August 1963, while participating in the Pacific Ocean Biological Survey Program of the Smithsonian Institution, I was on a ship which passed through a feeding flock of Wedge-tailed Shearwaters (*Puffinus pacificus*) and Sooty Terns (*Sterna fuscata*). Since records of this sort are rare in the literature, and since they are very important in expanding our knowledge of the natural history of seabirds, a condensed account of this observation is presented in the following note.

Location: 16° 59' N by 169° 11' W, ca. 20 miles east of Johnston Atoll, Pacific Ocean. Time: 2330 to 2345. Environment: moon, full; air temp., $26.7 \pm 0.1^\circ$ C; sea surface temp., $29.7 \pm 0.3^\circ$ C; wind ca. 11 knots from east; sea, relatively calm; sky, scattered clouds. Equipment, heavy battery-powered flood light, 7 × 35 wide-field binoculars.

As many as 20 Sooty Terns and 10 Wedge-tailed Shearwaters were observed at one time, but total numbers were undoubtedly much larger, perhaps reaching as many as 100 birds. An accurate estimate was impossible because of the limited field of the flood light and the constant erratic movements of the birds. The ship, moving at about eight knots, apparently passed through a relatively stationary flock since the first birds encountered around 2230 hours were milling about but not actively feeding. Increasing numbers of both species were seen, culminating in large numbers actively feeding, at 2345 hours. After this time numbers thinned out, and no more feeding was observed.

Wedge-tailed Shearwaters were observed to plunge into the water after small fish about three inches long. Often they would chase the fish by paddling awkwardly along the surface with their head and neck beneath the surface. When a fish was caught, the bird would rise into the air and swallow it in midflight by a slight upward flip of the head. The Sooty Terns were apparently feeding by capturing the fish at the surface without hitting the water. The Terns were constantly calling as they dashed back and forth low over the water.

This report is Paper No. 20, Pacific Ocean Biological Survey Program, Smithsonian Institution.—PATRICK J. GOULD, *Department of Vertebrate Zoology, Smithsonian Institution, Washington, D.C. 20560, 1 November 1966.*