shock was followed with a different pattern of behavior. The first bird to reach the food did so by reaching over the wires, and the other birds did likewise following the initial shock experience of each. This course to the food was not varied further during the third period of observation. On the fourth day the first bird to experience shock gave an alarm call, and all of the birds were immediately flying wildly about the cage. But calm was soon restored, and one of the birds hopped over the wires to food. All of the other birds then did likewise after each had received an initial shock experience, and the pattern of behavior was set for all of the birds during the remainder of that period of observation. On the fifth day each bird again received an initial shock experience. The first bird to reach the food then did so by hopping over the wires, and this became a uniform course to the food through another period of observation.

During every period of observation each of the birds received an initial shock experience. After the initial shock one of the birds hit on a course to food in which no shock was encountered, and this invariably became the route to the food for all of the birds during the remainder of that observation period. Individuals which had not yet received an initial shock experience before one of the birds had established a course to the food and water failed to adopt the course until after the initial shock experience. The response of the group to the alarm call of an individual was somewhat different in that response was simultaneous on the part of all individuals.

These Slate-colored Juncos showed a different pattern of response to the same stimulus in the face of alternate possibilities for expression. The pattern for hopping over the wires was set twice by the same bird and once each by two other birds; the pattern for reaching over the wires was set by one of the above birds which had once earlier set the pattern for hopping over the wires; and the "frenzied" state was initiated by a fourth bird. An appropriate auditory stimulus, expressed by one bird, was immediately effective at inciting a new pattern of behavior in each member of the group or a uniform pattern for the group. The tactile stimulus studied in this experiment seemed to need visual reinforcement before a new pattern of behavior was expressed by successive individuals. After the lapse of 22 hours the birds needed to be "reminded" of the disagreeable effect of the wires, but one shock experience daily caused the birds to avoid the wires through a two-hour period of observation, providing the method of access to the food and water had been established.

Apparently the behavior of these Slate-colored Juncos was a "follow the leader" process. The leader was the first bird in the situation, but the same bird did not always act as leader. This type of response is well adapted to a bird with the gregarious habits of the Slate-colored Junco.—PAUL A. STEWART, *8640 N. State Rd., Westerville, Ohio.*

On Enemy Recognition.—Frequently one finds the statement that when birds attack some other animal it proves they consider it an enemy. This may be the case, though my own rather extensive experiments on enemy recognition in thrashers (Bull. Amer. Mus. Nat. Hist., 78: 213–242, 1941) indicate the matter is more complex.

The invalidity of the general conclusion that attack proves recognition is well illustrated by comparing two notes in 'The Auk' for October, 1950. On page 512, F. C. Cross reports Chimney Swifts, *Chaetura pelagica,* pursuing a Sparrow Hawk, *Falco sparverius;* on page 518, Malcolm Davis records Purple Martins, *Progne subis,* "dive bombing" model airplanes of a particular purple and yellow pattern. Cross' tentative conclusion is that the Chimney Swifts recognized the hawk as an enemy, or had been molested by it; presumably the rather absurd conclusion follows that the

Purple Martins recognized the purple and yellow model airplane, out of various other types, as an enemy or had been disturbed by it.

As the Purple Martins attacked only a purple and yellow model airplane, one might consider the matter from the viewpoint of the "releaser" school of behavior. The yellow and purple pattern would presumably be the "releaser." But it is difficult to imagine where that pattern, deep purple with a yellow diagonal streak across each wing, is repeated in an actual predator on Purple Martins.

If possible, one should not discard ideas without replacing them by better; though rather than having obviously wrong theories it is better to admit grouping in the complexities of biological observations for correlations. Pursuit and attack of an object by birds seems a complex thing; it appears to be, at times, the attack on an enemy; at times a response to a strange object; at times the result of over-belligerence; and at times play. More than one factor could operate at once. The size, shape, and color of the object could have an effect, as well as its motion, especially in relation to the bird. All this, too, without relation to the internal state of the bird that might behave differently at different times.—A. L. RAND, *Chicago Natural History Museum, Chicago, Ill.*

Four Additional Species for Panamá.—In the course of ornithological studies in the Republic of Panamá it was my good fortune to have the privileges of La Jagua Hunting Club for a period of three weeks in March, 1949. The location is on the savannas of eastern Panamá province, about 12 kilometers east by south of Pacora, and three kilometers in airline north by west of the small village of Chico, near the coast. Extensive marshes and ciénagas, bordered by forest and broad, open savannas, made this an exceptionally favorable place for aquatic birds. Mr. Watson M. Perrygo of the U. S. National Museum, who accompanied me, and I are much indebted to Mr. Karl Curtis and his fellow club members for allowing us the club privileges and for much pleasant and friendly hospitality during our stay. The records of the four species of birds here reported for the first time in Panamá are one result of our investigations. The complete report of our extensive collections will be incorporated for publication in a combined report on the birds of eastern Panamá.

Ardea cocoi, COCOI HERON.—On March 30, 1949, we watched an adult for a quarter of an hour on the open muddy expanse of Ciénaga Santo Domingo, in the region between Pacora and Chico. The bird was in company with a large scattered group of Wood Ibises, Egrets and a dozen or so Great Blue Herons that were feeding in the shallow water and mud bars of the lake, now partly dry as the date was toward the close of the dry season. The black crown and pale color characteristic of this bird were easily evident, and through our glasses we could see the finer details of the color pattern, so that there was no question of the identification. The contrast with the much duller colored Great Blue Herons near by was apparent even with the unaided eye. While we were trying to plan some means of approach a distant shot startled all of the feeding birds, and the heron disappeared. Half an hour later I saw it flying overhead, when again its light color was easily apparent. Baldomiro Moreno, our helper and a skilled hunter, had never seen one before. The species ranges widely throughout South America, but has not been reported previously in Central America.

Plegadis falcinellus falcinellus, EASTERN GLOSSY IBIS.—On March 18, 1949, at Ciénaga Campana, near the coast at Chico, I found three feeding together in the open. As they rose in flight I shot one, an immature male that is now in the U. S. National Museum. Natives knew it as the Coco Negro, and said that it was fairly common. The latter statement may be taken to mean that the White-faced Glossy Ibis prob-