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"Anting" behavior by Common Grackles and European Starlings.—While anting is not observed frequently in the wild, it appears to be a widespread avian behavior (e.g., Potter 1970, Lilleleht and Maavara 1978, Hendricks 1980, Sanders 1981, Sugihara and Heston 1981, Post and Browne 1982, Simmons 1982, Whyte 1981). Anting has been interpreted as a maintenance behavior in which metabolic products of ants may soothe skin irritated by unusually rapid feather replacement (Potter 1970, Potter and Hauser 1974). Anting may also function to control ectoparasites and pathogens found on the skin and feathers by supplementing the natural properties of preen waxes, which are known for their antibacterial and antimycotic properties (Pugh 1972, Pugh and Evans 1970, Ehrlich et al. 1986). The latter explanation is plausible because *B*-hydroxy fatty acids found in ants are strongly fungicidal (Schildknecht and Koob 1971, Beattie 1985), and coincidentally, these fatty acids are also a major uropygial secretion of several species of birds (see Jacob and Ziswiler 1982). If birds are using the intrinsic "soothing," antimicrobial, or possibly the antiarthropod, properties of ants, we hypothesize that birds should recognize these properties in other organisms or objects which might yield the same end result. Indeed, birds have been seen "anting" with millepedes as well as with marigolds (*Calendula officinalis*) (Clunie 1976, Eyles 1983, Dennis 1985). Millepedes have powerful defensive secretions used against arthropods (Monroe et al. 1962.). Marigolds reportedly have antibacterial properties, and the petals contain sitosterol (Duke 1987), a chemical known to inhibit oviposition in Acarid ticks and mites (Ambasta 1980). Consistent with the above hypothesis, we report "anting" by Common Grackles (*Quiscalus quiscula*) and European Starlings (*Sturnus vulgaris*) using mothballs. Commercially available mothballs are composed of naphthalene, a chemical known for its insecticidal and repellent properties.

Early in the spring of 1988, we placed mothballs in a flowerbed which bordered a vegetable garden in the suburbs of York, Pennsylvania. The garden was located 12 m from a sunroom. Overall, the weather for the observation period was sunny, with mean maximum and minimum temperatures and relative humidities of 29.5°, 15.5°C and 79%, 31.4%, respectively. On the afternoon of 24 June 1988, we saw a Common Grackle attempt to pick up a mothball. After several attempts the grackle succeeded in holding the mothball in its beak. It then extended its left wing and rubbed the mothball up and down the length of the shaft of each secondary feather. Subsequently, the grackle rubbed the mothball throughout the secondary coverts on the ventral side and into the propetagium area. The grackle then repeated the same rubbing pattern on its right wing. The entire rubbing pattern lasted 10 min, after which the grackle dropped the mothball and flew away. On subsequent days (26 and 28 June), we observed a grackle pick up a mothball from the garden and fly to a perch. At these times the garden was in full afternoon sun, while the perches were shaded. In both instances, the rubbing pattern followed that described above. After both wings were rubbed with the mothball, the grackle would drop the mothball. These observations would explain our earlier and frequent observations of finding mothballs in areas of the yard quite different from their original placement.

The observation that grackles use mothballs in "anting" behavior has been reported previously (Dubois 1969). But grackles are not the only species for which this behavior has been observed. In discussing this behavior with Mrs. Naadi Perry of Washington, D.C. (pers. comm.), we learned of similar behavior by European Starlings. On at least four occasions in June 1985, starlings were seen picking up mothballs from a garden and rubbing their wing feathers in a manner similar to that described for grackles.

How do birds recognize objects to employ in "anting" types of behavior? The classes of objects or organisms reported in the literature invariably have antimicrobial or insecticidal

properties. There are no reports that birds exhibit "anting" with objects or organisms that are unlikely to possess such properties. If birds are selecting objects based on their chemical properties, then they must be able to discriminate such objects using chemical cues. It generally is believed that passerines have a poorly developed sense of smell (Bang and Cobb 1968). However, recent studies have shown that at least two passerines, starlings and Brown-headed Cowbirds (*Molothrus ater*) have an olfactory sensitivity comparable to birds with more well developed olfactory anatomies (Clark and Mason 1989, Clark and Smeraski 1990). Also, it may not be unreasonable to suggest that birds can make the associations necessary for anting. Clark and Mason (1985, 1987, 1988) have shown that starlings use the chemical attributes of plants to decrease parasite and pathogen load at nests and that they may use olfaction as a means to discriminate among plants. We suggest that future studies focusing on anting consider the behavioral capabilities of birds to perceive chemical cues of high biological relevance.

In the context of our current observations, it should be noted that naphthalene is registered by the U.S. Environmental Protection Agency as a bird repellent. Clearly, the seven observations indicate that at least two or more birds were not repelled by naphthalene, suggesting that the types of compounds that are repellent to arthropods may not be repellent to birds (e.g., Dolbeer et al. 1988).

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Nest predation of Plumbeous Ibis by Capuchin Monkeys and Greater Black Hawk.—The Plumbeous Ibis or "Curicaca" (*Harpiprion caerulescens*) is a neotropical species patchily distributed from Tucumán in Argentina north to Mato Grosso in Brazil, Paraguay and Central Bolivia (Meyer de Schauensee 1970). It is uncommon and little known, but information on its general ecology and behavior is available (Belton 1984, Sick 1985, Cintra 1986). In the Pantanal region of Mato Grosso, along the Transpantaneira Highway (about 56°55'W, 17°16'S), I have found this species to be fairly common and I located some nests which contained from eggs to young near fledging (up to three per nest) in August–September. This may indicate two consecutive clutches per year. Unlike other ibises, the Curicacas do not nest in colonies, nests being constructed more commonly on the horizontal limbs of huge fig trees (4 of the 5 nests), I found from 8 to 20 m high. The nest is made of twigs, resembling that of the Wood Stork (*Mycteria americana*).

In the early morning of 5 September 1987, while I followed a group of three capuchin monkeys (*Cebus apella*) in a forested area near the Transpantaneira Highway, one of the monkeys located an ibis' nest about 15 m high on a leafless tree. The monkey climbed to the nest, and immediately was faced by the brooding ibis. The sitting bird threatened the monkey with its half-open bill and uttered harsh cries, trying to strike as the monkey came closer. At each of the bird's attacks the monkey hit it on the head with one hand, managing