The second case involved an unbanded helper of unknown age and parentage; the nest was observed from a nearby building and three mockingbirds brought food to the nestlings.

Group territories and cooperative breeding occur in Galápagos Mockingbirds (*Nesomimus*, Hatch 1966), and helpers may possibly occur in Long-tailed Mockingbirds (*Mimus longicaudatus*, Marchant 1960). In Tropical Mockingbirds (*M. gilvus*) in Venezuela, Skutch (1968) found that fledglings remained with their parents during later broods. In Chalk-browed Mockingbirds, young of the last broods usually remain associated with their parents for the entire nonbreeding season (February–August). The described case that involved a banded helper suggests that breeding Chalk-browed Mockingbirds may at times have close relatives among their neighbors. The case may also be suggestive of reciprocal altruism (Trivers 1971), as this individual finally obtained good nesting sites in which it reared several broods. As I have studied 59 nests of mockingbirds, it is obvious, however, that helpers seldom occur in this species.

Family Sylviidae

Masked Gnatcatcher (*Polioptila dumicola*).—Although I have studied 26 nests of this gnatcatcher, only one case of cooperative breeding was found. In October 1974, in a small isolated woodland, a male was associated with two females. This case involved bigamous mating and communal nesting. The two females and the male built a nest in which a double clutch of six eggs was laid. Only four nestlings survived, so the bigamous bond was disadvantageous for at least one of the females, although both brought food at roughly equal rates. Masked Gnatcatchers are usually monogamous, and the pair bond may persist for more than one breeding season. Juveniles of last broods remain with their parents for up to 6–7 months, and within the family groups dominant individuals (chiefly the breeding males) are preened by subordinate ones. Allopreening was not observed between the male-sharing females, but this would not exclude the possibility that they were sisters.

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Cleaning/Feeding Symbiosis Between Grackles (*Quiscalus*: Icteridae) and Map Turtles (*Graptemys*: Emydidae)

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Cleaning symbiosis has been reviewed recently by MacFarland and Reeder (1974, Z. Tierpsychol. 34: 464–483). They cited symbioses involving fish, terrestrial mammals and oxpeckers, crocodiles and sand-

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pipers, fish and crocodiles, geckos and tortoises, crabs and finches, and finches and marine iguanas. They also described a cleaning symbiosis involving Darwin's finches (Geospizinae) that remove ticks from the Galapagos giant tortoise, *Geochelone elephantopus*. This paper reports a cleaning/feeding symbiosis in which the Common Grackle (*Quiscalus quiscula*) removed leeches from map turtles (*Graptemys*).

On 9 June 1977 I was observing basking behavior of map turtles in the Mississippi River near Stoddard, Vernon County, Wisconsin. Three species of map turtles (*Graptemys geographica, G. ouachitensis,* and *G. pseudogeographica*) occur in the area. At 1100 CDT I began observing (30× telescope) a group of 18 female and 5 male *Graptemys* basking on a log about 150 m from shore. At 1115 an adult grackle landed on the log, and three turtles slid into the water. The grackle walked along the log and inspected all four leg cavities of two female *G. ouachitensis*. It pulled something from one cavity and flew away. At 1125 apparently the same grackle returned, inspected various leg cavities of 11 more turtles, and appeared to remove three more objects before leaving. At 1130 the grackle returned, inspected two female turtles, then began pulling in the left rear leg cavity of the second turtle. The object was attached so well that the turtle was rocked back and forth on the log as the grackle attempted to pull the object from the turtle. During this process the turtle's legs remained motionless. After successfully removing the object, the grackle flew approximately 3 m to another log and began pecking at the object while holding it against the log with its right foot. I was finally able to discern that the grackle was removing leeches. The bird continued to forage on leeches intermittently for approximately 2.5 h. By 1400 the grackle had not returned for 20 min and observations were terminated.

On 14 June 1977 I returned to the same site and photographed a grackle again feeding on leeches from 1030 to 1230. This time I had the use of a 1,200-mm Celestron telescope. In both sessions the photos taken were too grainy for publication but are available for examination.

On both occasions only one bird was present at a time. I could not ascertain, however, if the same bird was involved in both cleaning sequences. I have watched basking behavior of *Graptemys* on numerous occasions during the last 5 yr. On none of these occasions have I noticed similar behavior. These observations may document the behavior of an individual bird that has learned how to harvest leeches.

Presumably the species of leech involved is *Placobdella parasitica,* as this was the only leech found attached to over 2,000 *Graptemys* examined at this site. Leech harvesting by grackles may be efficient only in the first 2 months of activity after emergence of the turtles from hibernation. Ernst (1971, J. Parasitol. 57: 32) reported large numbers of leeches (2.4 per turtle) on painted turtles (*Chrysemys picta*) from Pennsylvania in May and June. He suggested that the turtles are heavily infested because they have not been able to bask. Wild-caught turtles that I have allowed to hibernate in the lab have developed leech infestations numbering up to 89 leeches per turtle. It has been suggested that basking dries the skin so that leeches will desiccate and detach (Boyer 1965, Ecology 46: 99–118; Gibbons 1967, J. Parasitol. 53: 818–821; Ernst, op. cit.). This may be the case in some areas, but the length of basking time required to bring this about has not been established. I have kept *Graptemys* out of water for 4 days and still found live leeches attached. It may be that some populations depend upon cleaning by birds during spring basking.

Basking of turtles with limbs outstretched has often been described as thermoregulatory behavior, or, alternatively, as serving to retard algal or fungal infestation. My observations suggest that it may in addition allow grackles the opportunity to consume leeches. Most of my observations of basking took place after midsummer, at which time leech infestations are low, female turtles are no longer basking in large numbers near nesting beaches, and grackles are no longer feeding their young. This cleaning symbiosis has been noted only in the spring. It would be important to document at what carapace length the young turtles permit grackles to pick leeches from their bodies. Grackles and Red-winged Blackbirds (*Agelaius phoeniceus*), along with gulls, herons, and crows have been observed consuming hatchling turtles in large numbers as they move from the nests to the water. Within a turtle's life-span it must adjust its behavior from avoiding a potential predator while young to allowing this same predator to pick leeches from its body after this predator is no longer a threat.

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