

ECOLOGY OF PATERNAL BEHAVIOR IN THE HOARY MARMOT (*MARMOTA CALIGATA*): AN EVOLUTIONARY INTERPRETATION

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ABSTRACT.—Male hoary marmots living in isolated colonies at Mount Rainier National Park demonstrated a significantly greater involvement with their infants than did males living in a larger, more interactive social situation. Paternal behavior correlated inversely with frequencies of extrapaternal social interaction. This pattern is seen as maximizing male fitness in each situation by providing for male defense of his reproductive interests when this is dictated by the proximity of other adults and facilitating direct paternal involvement when relative isolation reduces the advantages of extrapaternal sociality.

Parental behavior among mammals—and indeed, the study of parental behavior—emphasizes the role of the mother. This is understandable, given that mammarys provide the female mammal with a unique opportunity to provide nutrition for her offspring. Indeed, the “typical” mammalian pattern involves only a brief copulatory pairing between male and female with the female-infant nexus providing the only lasting association (Eisenberg, 1966). However, some degree of paternal behavior has been reported for a variety of mammals, ranging from group defense in baboons (DeVore and Hall, 1965) and zebras (Klingel, 1969) to provisioning in wolves (Fox, 1971) and African hunting dogs (Kuhme, 1965). The present study reports some variations in paternal behavior of the hoary marmot (*Marmota caligata*) and interprets these patterns as maximizing the fitness of individual males.

METHODS AND RESULTS

I studied the social behavior of hoary marmots in the northeastern section of Mount Rainier National Park, Washington, during the summer of 1974. The study areas consisted of the southwest facing slopes of Berkeley Park, the northernmost extremity of Burroughs Mountain, the northern ridge of Mount Fremont, and the western slopes of Skyscraper Mountain. The latter three areas were relatively isolated (two kilometers from the nearest other resident animals and separated by precipitous ridges). They resembled the “isolated colony” situation previously reported for the Olympic marmot, *M. olympus* (Barash, 1973). No behavioral interactions were observed between residents of each of these sites and any other animals from 4 June to 20 August. In contrast, the Berkeley Park site could be divided into three subunits, each consisting of groupings comparable to the three isolated colonies and the site resembled Olympic marmot “colony towns” (Barash, 1973) in that interactions among all adult residents were frequent. Berkeley Park contained three adult males, each associated spatially with a different