



Creating the Nation's first BioPark

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Letter From the Desk of David Challinor  
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The parents of Moses put him in a floating cradle and sent him down the Nile in hopes of saving him from Pharaoh's soldiers who had been ordered to kill all newborn Hebrew boys. Moses survived, rescued by Pharaoh's daughter who raised him at her father's court around 1400 BC. Meanwhile, across the Mediterranean, the Greeks were creating a myth in which Heracles was earmarked for death by the goddess Hera, who put venomous snakes into his crib. As with Moses, the planned infanticide was foiled when the infant Heracles strangled the serpents. Thwarted infanticide also appeared in the legends of Oedipus (about 5th century BC) and Romulus and Remus (4th century BC), twins sired by Mars and ordered drowned in the Tiber.

These ancient tales illustrate the ubiquity of the distressing practice of infanticide through man's recorded history. Common during the Middle Ages in Europe, it sadly still persists in southeast Asia where the victims are often female. Although attempted infanticide through abandonment is not uncommon in the United States, it is rare enough to be a news item. Rather than deal with the emotionally-charged social and cultural forces that cause humans to resort to infanticide, I will discuss this practice in terms of a possible reproductive and evolutionary strategy in animals.

Infanticide in birds is usually carried out by nest-mates, either those that have hatched first or by larger parasitic young, e.g. cowbird hatchlings actually toss warbler host eggs from the nest. One bird species that actually kills the young of other females is the jacana, a lily-trotting tropical bird about which I wrote in my letter of September 1992. Asynchronous hatching of eggs in a nest can be advantageous to survivors of the species when late freezes or other weather conditions cause a scarcity of normal food sources for early hatchlings. Later hatchlings can survive when food availability returns to normal.

Causes of mammalian infanticide seem more complicated than those of birds. Active lethal assault on abandoned fledglings in colonial nesting seabirds (penguins, gannets, et al) is prevalent and practiced by the adults occupying nearby nests. Among primates, infanticide by males as an evolutionary strategy has been widely accepted, although a recent article by Kathryn Brown suggests that evidence supporting this behavior is flimsy. (BioScience 46(3):174-180, 1996) Darwin hypothesized that males



compete with each other for access to females and vice versa. The successful competitors would then produce more progeny, thereby ensuring that the "best" will survive. The role of infanticide in the sexual selection process is based on the idea that in certain mammalian species, a successful male invader will kill the young, still dependent on lactating mothers, both to remove the offspring of the defeated troop leader and to hasten the estrus cycle of the females who would then no longer be nursing.

Sarah Blaffer Hrdy described infanticide as a male reproductive strategy in a paper on Indian langur monkeys. She noticed that shortly after a new male took over a troop, all the nurslings disappeared. She did not, however, actually observe the victorious male killing the infant monkeys. Numerous reports exist of similar infant disappearance in other polygynous mammals such as mice, lions and even horses. Indeed, almost 30 different species have been recorded as engaging in this behavior.

One scientist, Robert Sussman of Washington University in St. Louis, was skeptical of the claims of primate infanticide and with colleagues reviewed 48 papers reporting this practice in primates. He found that only six of the 48 cases fit the four essential conditions of Hrdy's model: 1) invading male kills unrelated infants; 2) nursing mother comes into estrus soon thereafter; 3) invading male then mates with that mother; and 4) new male thus fathers more offspring than he would have, had he not practiced infanticide. Since there were so few reports that actually filled Hrdy's four criteria, Sussman concluded that many cases of reported infanticide may have resulted instead from babies being accidentally killed in the battles for troop leadership (paramount breeding rights) between competing males. The solution to the conflicting theories of primate infanticide will undoubtedly require more data on primate troop behavior, especially in the wild.

Other polygynous mammals practice infanticide. In the late 1970's Vom Sääl studied mouse behavior at the University of Missouri. Within his laboratory colony he noted that the male would kill all young he encountered when the females were pregnant. However, shortly before birth, the male would change behavior abruptly and prepare a nest, as well as groom and protect the young once born. Vom Sääl's observations led him to conclude that the male mouse had a biological clock that was set when he bred a female. The release of sperm cells evidently triggered the aggressive behavior, but what caused it to cease so suddenly is still unknown. Further experiments with wild populations of rats, mice and gerbils in the United States and Europe parallels this basic behavior. It is important to remember, however, that conduct found in rodents does not necessarily apply to other mammals, especially primates.



A final example of infanticide is that observed in the Serengeti lion population of about 200. Ann Pusey of the University of Minnesota has studied these lions for 20 years and reported that about one-quarter of all lion cub deaths were attributable to males taking over new harems. She estimated that the victorious male would sire cubs about eight months sooner than he would have without the infanticide. Again, as in the case of the langurs, only ten infanticidal attacks have been recorded in the Serengeti because most occur at night. Only the following morning, when no cubs are seen in a pride just taken over by a new male, can the scientist speculate as to what happened. Scavengers are so ubiquitous there that cub remains are generally consumed by dawn. Thus, although infanticide has actually been observed in a lion population, it may still be relatively rare. Lionesses must have developed strategies to protect their cubs and thus thwart some takeovers.

In closing, I must be fair to both sexes and emphasize that it is not always the male that practices infanticide. The female jacana, which is about 60% larger than the male, kills the chicks of rival females to gain access to resident males which, in a reversal of common behavior, brood and protect the clutches of the dominant females. Furthermore, in prairie dog colonies, when food is scarce mothers kill the young of fellow colony members to ensure the survival of their own.

The principal unanswered question about animal infanticide is whether it is primarily a reproductive strategy as proposed by Hrdy, or whether it is abnormal behavior caused by such factors as starvation or crowding. Among humans, we westerners tend to consider infanticide as strictly abnormal, although in the east, cultural forces may make this practice less so. I find it upsetting that human infanticide still exists anywhere today, and I think most of us agree that we have a moral obligation to obliterate the practice. I would like to be more optimistic about reaching this goal, but as the world becomes more crowded and the incentive to develop cheap, effective birth control methods is rapidly disappearing in our litigious society, it is unlikely that the practice will decline significantly.

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