

NOTE ON SKELETAL INJURIES IN AN ADULT ARCTIC WOLF

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ABSTRACT

The desiccated corpse of an arctic wolf (*Canis lupus*) was recovered from central Ellesmere Island in summer 1986 near the skeleton of a musk-ox (*Ovibus moschatus*). External examination showed no evidence of the cause of death. Two old injuries, however, became apparent after the skeleton was cleaned. The right zygomatic arch and mandible had been fractured, as well as the right upper carnassial. Four left ribs (T9-12) had also been broken. The pattern and spacing of the skull and rib fractures suggest the impact of a hoof of a large ungulate such as a musk-ox was the cause. The wolf was old, and the bony fracture calluses were smoothed over, indicating old injuries.

Wolves (*Canis lupus*) jeopardize their safety while attempting to kill large prey (Rausch, 1967; Mech, 1970; Nelson and Mech, 1985). While wolves killed by prey are rarely found (Phillips, 1984; Nelson and Mech, 1985), examination of numerous wolf skulls by Rausch (1967) and Phillips (1984) evinced traumatic injuries, probably inflicted by severe blows from large hooved mammals. Savile and Oliver (1964) reported two dead wolves which had been gored by musk-oxen on Ellesmere Island. Successful kills of musk-oxen by wolves have also been sighted. Mech (1987) observed a wolf pack killing musk-oxen at Ellesmere Island, and Gray (1970) witnessed the killing of a bull musk-ox by a single wolf in the Northwest Territories. To kill musk-oxen without incurring injury to themselves wolves require speed, agility, and strength. Male musk-oxen may weigh 272 kg, females 181 kg, and travel in herds of up to 30 individuals. Using their curved horns and heavy hooves to defend themselves, musk-oxen appear easily able to kill wolves, and wolves treat musk-oxen with circumspection (Mech, unpublished).

Two wolf carcasses in winter coat were found near the skeleton of a musk-ox at Blister Creek, Ellesmere Island, Northwest Territories, Canada, in July 1986. The two wolves appeared to have died about the same time. One of the wolves (sex unknown) was acquired by the Royal Ontario Museum (ROM specimen 94176), the other, an adult male, by the British Museum (Natural History) (specimen 1986.1595). An external physical examination of the specimen obtained by the ROM showed no evidence of broken bones, unhealed wounds, or blood, so the cause of death remains unknown. The animal had been dead for some time; the carcass was completely desiccated and covered with blow flies (*Calliphora vomitoria*). The fur of the specimen was thick, matted, streaked with dirt, and was a uniform grayish-white, typical of arctic wolves (Mech, 1987). Because of peculiarities of the British Museum skull, Dr. Juliet Clutton-Brock (pers. comm., 1987) suggested that specimen 1986.1595 was probably a wolf/dog hybrid. Our specimen appears to be pure wolf (Nowak, pers. comm., 1987). Arctic wolves have little contact with domestic ani-

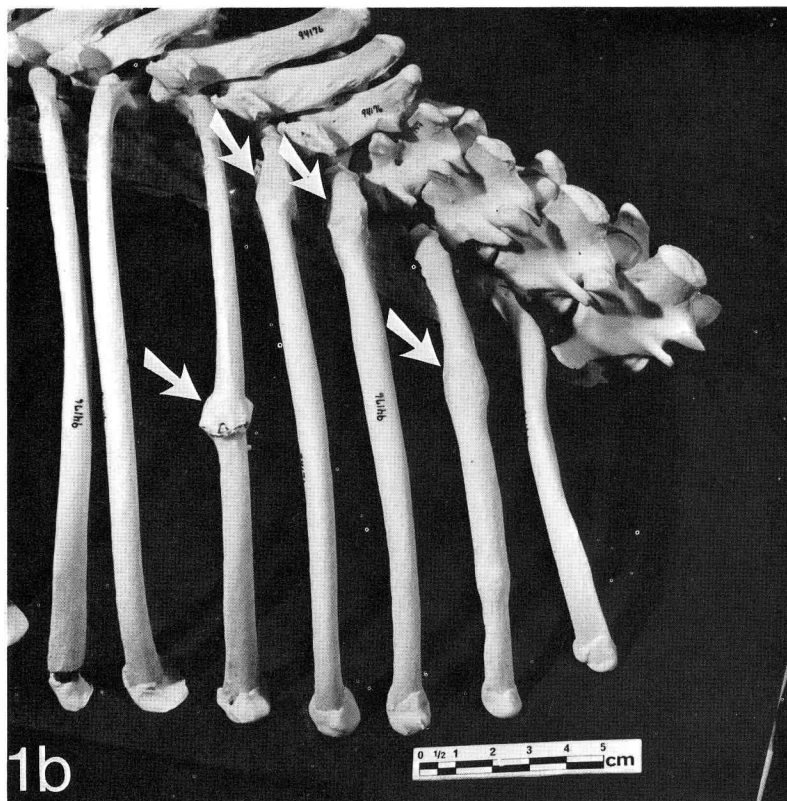
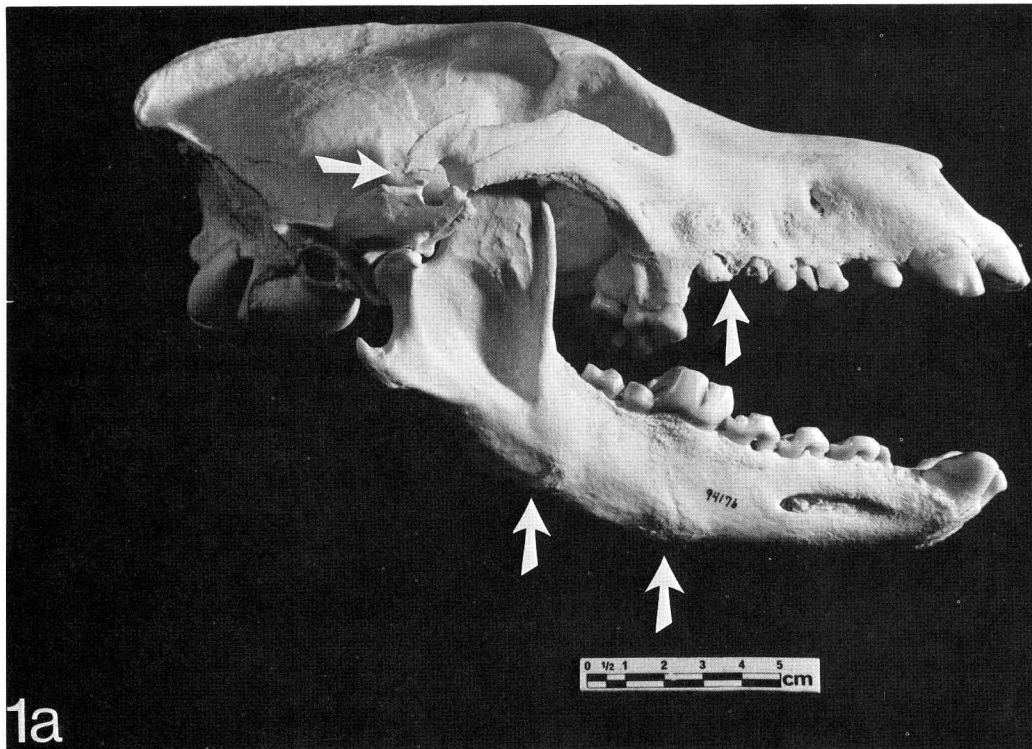


FIGURE 1. Skull and ribs of wolf showing old fractures: (a) fractured right zygomatic arch and callus buildup on lower mandible; (b) four left fractured ribs.

mals, but since wolves do interbreed with dogs (Peterson, 1966) and sometimes travel hundreds of kilometers (Fritts, 1983), there exists a possibility that either specimen could have inherited some dog genes.

The Royal Ontario Museum specimen was prepared as a skull and skeleton and examined for evidence of injury; no recent fractures or injuries were found. However, the right zygomatic arch was fractured (Figure 1a), the break occurring at the junction of the posterior tip of the jugal and squamosal. The injury had healed and there was no callus present, indicating that the injury was old. The zygomatic arch had not set properly, and the anterior and posterior parts had never fused together. On the right side of the upper jaw the second premolar (Pm2), third premolar (Pm3), and fourth premolar (Pm4) had been broken and only the roots of the teeth were still present. The teeth are heavily worn, indicating an old individual. On the right side of the lower jaw, below the first molar tooth, there is evidence of a multiple fracture, the mandible being broken in two places (Figure 1a). Radiographic examination did not show any fracture lines. The distance between the break in the arch and Pm2 is approximately 13 cm, suggesting that the injury may have been caused by a musk-ox or caribou (*Rangifer tarandus*) hoof. Such damage to the skulls of wolves is relatively

high: Phillips (1984) reported a frequency of 22% cranial injuries due to blows by hooves of prey animals.

Our specimen also exhibited four left fractured ribs (T9–12) (Figure 1b). Rib nine was broken approximately 11 cm from its head, ribs 10 and 11 about 4.5 cm from their heads, and rib 12 was broken in two places, at 7.5 and 12.5 cm from its head. The crescentic pattern and spacing of the rib fractures suggests the injury was inflicted by a hooved mammal, most likely a musk-ox or caribou.

The injuries to the head and ribs were at different stages of healing. Callus bone was completely digested away on the skull, whereas around each fractured rib a smoothed fracture callus was still present, indicating that the two injuries probably occurred at different times in the wolf's life. Wolf skulls, skeletons, radii, and ulnae examined by Rausch (1967) showed numerous fractures, some of which had healed, with others still in the process of healing. During the critical period following a severe injury wolves are dependent on other pack members for food, and the social nature of wolves facilitates the survival of wounded individuals (Rausch, 1967).

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