# RED DEER: THEIR ECOLOGY AND HOW THEY WERE HUNTED BY LATE PLEISTOCENE HOMINIDS IN WESTERN EUROPE

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Fossil hominid morphology, archaeology, and genetics indicate that in Europe 30,000-40,000 years ago, anatomically modern humans and their Upper Paleolithic industries replaced Neandertals and their Middle Paleolithic tools. Neandertals had thrived for hundreds of thousands of years, so why were they replaced? One possibility is that modern humans were able to extract more resources from the environment. This dissertation tests this explanation by assessing variation present in ancient hunting practices and investigating the relationship between Late Pleistocene hominids, tool industries, and hunting. I examined the hunting of one species, red deer (*Cervus elaphus*), through time and across space using prey age-at-death as an indicator of hunting strategy. In the process, I evaluated the ability of the Quadratic Crown Height Method to accurately assign age-at-death; compared how well histograms, boxplots, and triangular graphs reconstruct mortality profiles from fossil assemblages; and developed a novel method for statistically comparing samples on triangular graphs.

My results show that Neandertals and modern humans did not differ significantly in their ability to hunt prime-age red deer. None of the mortality distributions from the archaeological samples resemble the distribution constructed from elk killed by wolves in Yellowstone National Park, Wyoming. Like other carnivores, wolves usually take young, old, and infirm prey. Nevertheless, the samples included in this study show a shift in prey age-at-death during the Middle Paleolithic approximately 50,000 years ago. Young adult prey are more abundant in recent assemblages than in more ancient assemblages. Over 25 archaeological samples from western Europe contribute to these conclusions, making this dissertation the most comprehensive study of Pleistocene hunting to date. More well-dated samples are needed, however, to confirm these results.

Because red deer skeletal and tooth size fluctuated across my samples, I investigated the relationship between climate and *C. elaphus* size to determine if body size could indicate paleoclimates. In modern North American specimens, distal metatarsal breadth has a good relationship with climate, and tooth breadth has a similar but weaker relationship. The modern European data do not relate clearly to climate. Fossil red deer are larger during glacials than interglacials, but additional data are needed to better define patterns.