Getting to the Point: Evolutionary Change in Prehistoric Weaponry

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The evolution of prehistoric weaponry remains an open question in North American archaeology. The traditional model argues for an early use of the throwing spear followed by the spearthrower and bow and arrow. A major difficulty in testing this model is identifying the functional variables that characterize different weaponry. The evolution of prehistoric weaponry is reexamined here from an evolutionary perspective where projectile points are considered part of the complete weapon system and variation within that system is identified. The engineering of four weapon systems, the thrusting spear, throwing spear, spearthrower, and bow, are examined to identify those point variables that enhance the success of the system. These variables are then measured on a 9000-year sequence of projectile points from northwestern Wyoming to examine time/space patterns. The patterns reveal that the spearthrower was in use prior to 7500 years ago.

KEY WORDS: projectile point; prehistoric weaponry; engineering of primitive weaponry; weapon evolution; Mummy Cave.

INTRODUCTION

How and why prehistoric flight weaponry evolved remain unresolved issues in North American archaeology. The traditional model, generally articulated for the Plains and elsewhere, proposes that the throwing spear was in use during the early Holocene. The appearance of triangular notched points marks the arrival of the spearthrower around 7500 years ago. The bow and arrow replaced the spearthrower between 1500 and 2000 years ago when small points dominate the archaeological record (Blitz, 1988;}

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Frison, 1978; Josselyn, 1961; Shott, 1993; Van Buren, 1974). More recently, Frison (1989, 1993) and Christenson (1986) argue that spearthrower technology may have existed well before 7500 years ago, whereas Patterson (1993) and others (Bradbury, 1997; Odell, 1988) propose that the bow and arrow arrived in the Middle Holocene with the appearance of unifacial point flaking (discussion in Shott, 1997). Shott (1993, 1997) and others (Bradbury, 1997; Nassaney and Pyle, n.d.; Odell, 1988) suggest that spearthrower and bow technology may have coexisted for various lengths of time.

Testing models of weapon evolution is extremely difficult because stone projectile points are often all that remain of weapons in the archaeological record, and linking a point to a given weapon system is problematic at best (Blitz, 1988; Christenson, 1986; Odell, 1988). When examining an isolated point, it is uncertain which point attributes will accurately and consistently identify its weapon system. A number of studies have attempted to make this link by using weight, neck width, shoulder width, maximum width, length, and thickness measurements as distinguishing variables (Bradbury, 1997; Christenson, 1986; Corliss, 1972; Fawcett and Kornfeld, 1980; Fenenga, 1953; Nassaney and Pyle, n.d.; Odell, 1988; Shott, 1993, 1996, 1997; Thomas, 1978). These studies demonstrate morphological change through time, but the meaning of these changes is uncertain.

The best attempts to make this link are based on Thomas's discriminant function coefficients (Bradbury, 1997; Nassaney and Pyle, n.d.; Shott, 1993, 1996, 1997; Thomas, 1978). These coefficients were developed from a sample of ethnographic and archaeological darts and arrows (Thomas, 1978), a sample recently enlarged by Shott (1997). The coefficient equations appear to separate dart from arrow points with some degree of success, however, overlap exists especially within the “dart” group. Unfortunately, this technique is useful only in distinguishing darts from arrows.

This paper offers a new approach to examining the evolution of prehistoric weaponry, evolutionary theory. Evolutionary theory provides a way to link points to their weapon systems through a study of weapon engineering. Four prehistoric weapon systems known to incorporate stone tips are examined here: the thrusting 'spear, throwing spear, spearthrower/dart, and self bow/arrow. The first is a confrontational weapon, while the last three are flight weapons. Throughout the remainder of this paper, a projectile point is referred to as a tip, the sharp, pointed end of the tip is referred to as the point, and the hafting element is the tip base.