

Letters to the Editor

A Forum for Commentary on Articles and Research Issues

Defining Complex Projectile Technology: A Reply to Whittaker

First, we thank Whittaker for his comments. During the preparation of our paper the physics of the spearthrower was a subject of some debate between us. As Whittaker demonstrates, both models of the mechanics of the spearthrower/dart are well represented in the literature. We eventually chose to use the model that we did because it lent itself to a more concrete definition of “complex” vs. “simple” projectiles. In this case, simplifying the system in search of a dichotomy was an error. We largely agree with Whittaker’s alternate definition for complex projectiles as those where “human energy is mechanically enhanced or stored” but with one further slight, yet crucially important, modification.

In defining complex vs. simple projectiles we sought to make a distinction between multi-component weapon systems, such as the bow/arrow and spearthrower/dart from relatively simple projectile technologies, such as javelins and throwing sticks. The former are undeniably complex instruments that call for different elements to be assembled and combined into a functioning whole. The latter are not (or at least not necessarily so). Such javelins and throwing sticks as have been recovered from archaeological contexts, and many of their ethnographic counterparts, were created by simple subtraction; reducing the mass of a larger original piece of raw material.

In this case, Whittaker’s proposed definition is somewhat ambiguous with respect to just what constitutes “enhancement.” We agree with the sense, but also could easily see a reading of this definition that includes some

unintended tools. For instance, the aerodynamic shaping of some throwing sticks would enhance the human energy imparted onto them by reducing drag during the throw and generating lift in flight. Thus we suggest that the adoption of a definition of complex projectile weaponry as “composite, multi-part tools where human energy is mechanically enhanced or stored by a non-projectile part.” While perhaps less elegant, this definition includes the bow/arrow and spearthrower/dart and excludes javelins and throwing sticks. It also includes technologies such as the blowgun, sling, and firearms, which, while not discussed in our paper, should be included among complex projectile weapons.

In conclusion, we again thank Whittaker and the Editor of *PaleoAnthropology* for giving us the opportunity to refine our definition in an open and productive forum. Now that we have our definitions sorted out, we look forward to further discussions and debate about the role of complex projectile technology in *Homo sapiens* dispersal from Africa to Western Eurasia.

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