



Point-Counterpoint

The X files: Xenophon re-examined through the lens of equitation science

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ARTICLE INFO

Article history:

Received 20 January 2013

Received in revised form 11 March 2013

Accepted 26 March 2013

Available online 13 May 2013

Keywords:

equitation science

ethology

learning theory

classical riding

ethical training

ABSTRACT

This article reviews, through the lens of equitation science, one of the oldest known texts on horsemanship, written by Xenophon, general and horsemaster from ancient Greece. It identifies many instances in which Xenophon's recommendations align with current knowledge about equine ethology and learning theory, although, as one might expect, the explanations for their effectiveness are sometimes lacking. Xenophon counsels against disciplining a horse in anger and the use of relentless rein tension but makes a series of flawed assumptions about contiguity in instrumental conditioning. Because he is held up as the classical master and, therefore, somehow beyond reproach, it is important to understand how Xenophon's work exemplifies many of the pitfalls in thinking that persist in contemporary training. For example, his treatise imbues horses with powers of reasoning that have yet to be demonstrated in any empirical studies. In doing so, it encourages the reader to regard unwelcome behavior as disobedience and, predictably, goes on to justify punishment. The review explores how Xenophon aligns with and counters the recently published principles of ethical horse training. As such, it offers a framework for critiquing all horse-training dogmas.

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Introduction

Xenophon, a military commander and horseman from ancient Greece, is considered one of the first equestrian authors and is held up by many as offering an exemplary approach to equitation. Indeed, such is the acclaim and reverence his famous essay "On Horsemanship" has attracted, there is an international dressage society (based in Germany) that bears his name. The Xenophon Society proposes to "teach the fundamental ideas of classical training" and comment "on misguided developments in equestrian sports which damage the welfare of the horse" (Xenophon Society, 2012). The society's devotion to classical principles is a laudable attempt to assure the welfare of ridden horses, especially in dressage, but it is also a feature of most equestrian traditions because equitation coaching tends to bypass an evidence-based approach

(McGreevy, 2007). However, the merits of a scientific framework for revealing the mechanism of any effective horse handling and training regime are now emerging under the overarching remit of equitation science (Goodwin et al., 2008, 2009).

This article explores the alignment of Xenophon's recommendations (Xenophon, 350 BC) with current knowledge about equine ethology, learning theory, and the International Society for Equitation Science's (ISES) recently published principles of ethical horse training (ISES, 2011). As such, it offers a framework for critiquing all horse-training dogmas.

Equine ethology

Xenophon's essay shows clear appreciation that horses are calmer, more relaxed, and more easily trained when they have positive associations with humans and that these associations can be achieved when humans address social and environmental needs (e.g., with pleasing tactile stimulation, food, water, and shelter). As one might expect from a military man living in ancient times, Xenophon applies

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Table 1

An overview of excerpts from Xenophon's essay that relate to equine ethology and how they are supported or refuted by modern scientific evidence

Category	Excerpt from essay translation	Alignment with current evidence	Conflict with current evidence
Social needs	"A great deal can be done by touching, stroking, patting those parts of the body which the creature likes to have so handled."	Appreciation of benefits of touch and noting the benefits of stroking in anatomically and ethologically appropriate areas.	An endorsement of "patting," which has minimal benefit unless it has been conditioned as a secondary reinforcer, and can cause fear in sensitive horses that have not been previously habituated to it.
	"These are the hairiest parts, or where, if there is anything annoying him, the horse can least of all apply relief himself"	Noting the anatomical limits on autogrooming. No reference to the satisfaction of meeting social needs by mutual grooming and the resultant lowering of heart rate.	
Environmental needs	"... let the animal connect hunger, thirst and the annoyance of flies with solitude, whilst associating food and drink and escape from sources of irritation with the presence of man"	Comprehension of the importance of hunger, thirst, and pests and the benefit of associating relief from these with humans.	Failure to acknowledge the dangers of restricting food and water and the likelihood that imposing hunger, thirst, and pests will compromise welfare.
Formation of positive associations/avoidance of negative associations	"... pains should be taken on the owner's part to see that the colt is gentle, tractable and affectionate when delivered to the professional trainer."	Understanding of the beneficial effects on training for a horse with positive associations with humans.	
	"Now, if the horse be bitted not only when he has work to do, but also when he is taken to his food and when he is being led home from a ride, it would be no great marvel if he learnt to take the bit of his own accord, when first presented to him." "When the moment to dismount has come, you should never do so among other horses, nor near a group of people, nor outside the exercising ground, but on the precise spot which is the scene of his compulsory exertion there let the horse find also relaxation."		Incorrect assumption that horses can form positive associations with something that is only occasionally advantageous or, in the case of being led home, something that is regularly applied, but which is immediately after being ridden. Incorrect assumption that dismounting in the exercise area will cause the horse to form positive associations with the exercise area and that dismounting near other horses outside the exercise area will cause the horse to form negative associations with the exercise area.

these techniques for utilitarian rather than animal welfare gains. However, when he tries to apply this theory to other areas (e.g., by attempting to cause the horse to have favorable associations with the bit and bridle by periodically leading the horse home and to food), he fails to recognize that positive associations can occur only if the stimuli are predictable and constant (Table 1). He also assumes that horses have higher mental abilities than seems likely to modern scientific observers. For example, he assumes that a horse may be able to recognize that the use of the bit and bridle can occasionally have sufficient favorable outcomes, such as being led to food, to permit the formation of positive associations. This overlooks the probability that the bit and bridle are more often used for negative reinforcement activities which, even if temporary and subtle, have the potential to be highly aversive to the horse (McLean and McGreevy, 2005).

He also fails to recognize that advocating punishment with the whip when a horse, for example, fails to jump, will develop negative associations with the activity and apparatus. Horses can become sensitized to aversive events after only a few exposures (McGreevy and Boakes, 2007), and punishment can cause fear, anxiety, and frustration (Lindsay, 2000). Fearfulness can manifest as flight responses that are difficult to delete, can emerge spontaneously with little provocation (McGreevy and McLean, 2010), and are dangerous to both horse and rider. A fearful horse also may have a diminished capacity to learn and therefore be slower to acquire desirable responses.

Learning theory: nonassociative and associative learning

Xenophon observed the effectiveness of habituating horses to unknown objects and noises, but he may have overestimated the horse's higher mental abilities by advising that the handler should reassure the horse by touching the object himself (Table 2). That said, horses may be more threatened by unfamiliar objects that lie between the handler and themselves than by those alongside or behind the handler. To that extent, touching such objects may reduce their aversiveness. He also does not discuss desensitization or habituation to the rider's leg or seat for a "spirited" horse but advises sitting very still and using very light aids to not "annoy" him. There is no mention of the possibility of sensitizing a horse to a stimulus, for example, to the leg. A "sluggish" horse is decried as being hard work, but there is no solution suggested as to how this could be improved, much less avoided by using training. This loosely implies that horses are born to be sluggish or reactive, a proposition that may have some merit but that overlooks the possibility that these attributes can be conditioned.

Classical conditioning using verbal cues is discussed, and negative reinforcement is advocated widely as a training method. Positive reinforcement is proposed (although, of course, not by that name) and discussed in terms of being "good" to the horse and showing him "kindness." However, it is not clear what form rewards should take. This relates to a somewhat similar scenario

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