



The Angles of the Shoulder

Perhaps you have heard that there is a new Triple Crown winner in American Thoroughbred racing? On June 6, 2015 American Pharoah won the Belmont Stakes, the third of the three races comprising the Triple Crown. The horse became just the twelfth to accomplish this feat, ending a 37-year drought since the last winner. Prior to this achievement, talk had begun to circulate that it was no longer possible for a horse to successfully navigate the challenging three-race regimen. For instance, it was not uncommon for fully rested horses to contest the third race, theoretically putting the winner of the first two at a disadvantage because the schedule doesn't allow for much rest when running all three races. American Pharoah put these discussions emphatically to rest with a decisive victory in the third leg of the Triple Crown.

What made it possible for American Pharoah to succeed where other horses had failed for over three decades? There are many, many factors that contribute to a winning race horse. However, Bob Baffert, American Pharoah's trainer, indicated that it was at least in part the angle of the horse's shoulder that made him different. (1)

Figure 1 shows an equine skeleton showing the three different angles in the shoulder area: 1) the slope of the shoulder, 2) the angle of the shoulder, and 3) the angle of the forearm.

Sometimes the angles in the shoulder area are referred to generally rather than in the specific terms shown here. Each of them, however, contributes slightly differently to an equine's style of movement.

The slope of the shoulder is called out in many breed descriptions, including that of the Fell Pony. The slope of the shoulder is an angle that is typically considered relative to the ground. It refers to the angle at which the scapula lays relative to the horizontal. In some equines it is more upright, a steeper angle, and in others it is more laid back and 'sloping.' The Fell Pony breed description states regarding the shoulder: "...most important, well laid back and sloping..." (2)

What is typically called the angle of the shoulder is the angle between the scapula and the humerus. This angle is often measured in degrees or compared to a perfect right angle, either more acute or wider open. In American Pharoah's case, it was this angle of the shoulder that Baffert particularly noted, saying it is "the acute shoulder angle that allows him to extend his front legs further than most horses...." (3)

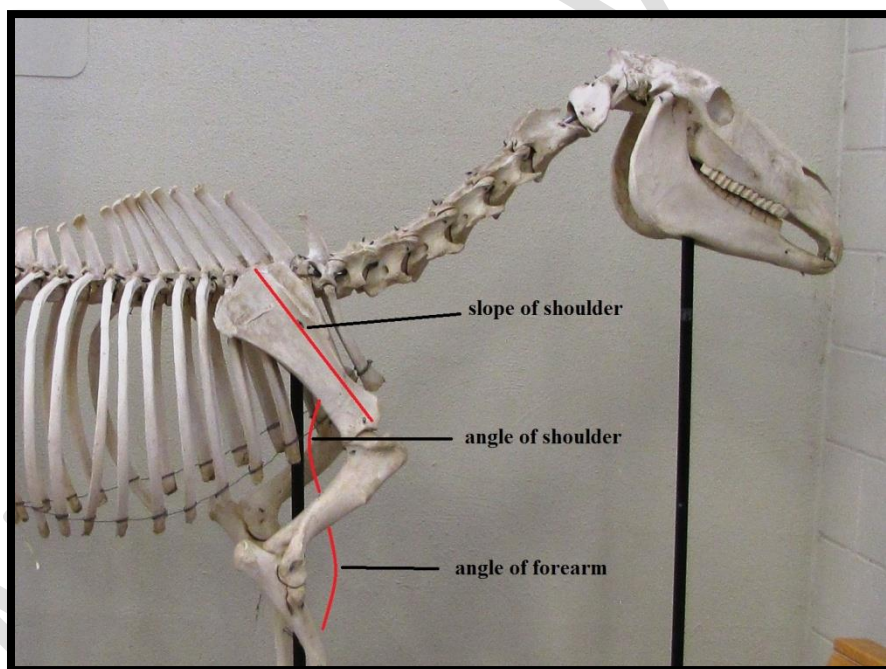


Figure 1: There are three angles in the area of the shoulder that contribute to a particular equine's style of movement.



The angle of the forearm is the angle between the humerus and the upper bone of the lower leg. While some talk just about the slope of the shoulder being important and others consider the slope and the angle of the shoulder, it is actually all three plus the lengths of the scapula and humerus that contribute to how an equine moves.

- 1) Layden, Tim. "American Pharoah," *Sports Illustrated*, June 15, 2015, p. 43.
- 2) <http://www.fellponysociety.org.uk/forms/DescriptionOfTheFellPonyAndScaleOfPoints.htm>
- 3) Same as #1.