THE BARE BONES OF FARRIERY
A differing slant on joint mechanics

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Traditionally, farriery limits detailed anatomy of the limbs, to below the knee and hock. Those nine bones, with which we should all be familiar, can combine to provide us with detailed information about the equine's supporting structure: a framework from which we can study both motion and force. With morbid specimens, photographic evidence and a little insight we can make informed judgements about the process by which the limb functions and so develop our plan for good farriery.

Our strategy for farriery has to be based upon ideals but with the need to identify what is normal. As farriers we must learn to change only that which we can improve and accept there are times when change will be an error, our skills and experience hopefully guiding us to understand and recognise the difference.

The joints, fetlock, pastern and pedal, could all be described as being three-dimensional. Dynamic in design and function, their cycle of movement should not be regarded as being limited to a simple range of dorsal and palmar movements. Instead it must be recognised and understood that their articular surfaces are also structured to simultaneously perform a subtle range of medial and lateral movements. These complex attitudes not only occurring during the stance phase, as the horse's bodymass is shifted over the hoof-capsule but also throughout the trajectory of the flight phase, as well as other normal weight-bearing and non weight-bearing attitudes, all of which the horse may naturally adopt. The bottom line being, which we all need to remember, is the joints are more complex than a door hinge!

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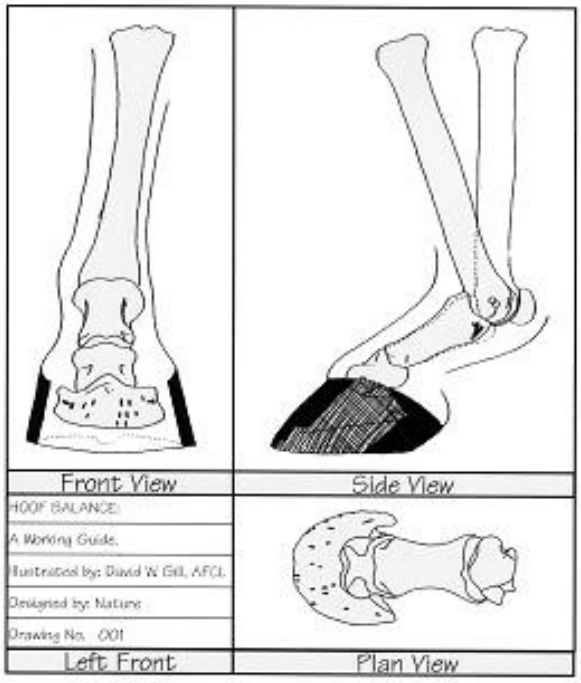
Developing a better perception of the form and function of these joints is essential if we are to perform our task intelligently. The acts of progression, absorbing concussion and maintaining balance, are all functions which have to be accommodated within the design of each joint, with the fetlock joint producing the greatest range both dorsopalmarly and mediolaterally.



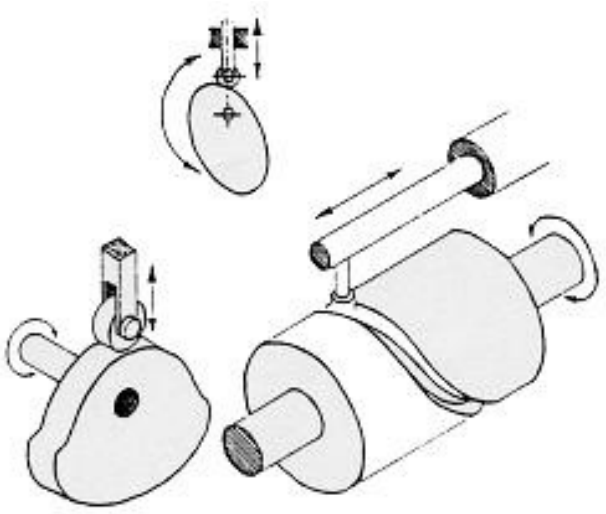
(Fig. 1) Our plan for farriery has to be a three dimensional one, with the added dimensions of movement, growth and wear.

The fetlock joint, with it's ability to assume a range of positions essential to both balance and movement, has its form dominated by a narrow surface known to us as the median ridge. This central ridge is located between two other much broader surfaces, known as the lateral condyles. The lateral condyles are irregular in shape, with the medial side being the larger, whilst the lateral side presents a slightly smaller articular surface.

Positioned either side of the median ridge, the condyles are eccentrically attached to the central shaft and act rather like cams. This design whilst attaining some rigidity and strength allows the long pastern to wind around the joint's central point; constantly changing it's relationship with the long axis of the cannon bone.

The pastern and pedal joints also perform similar actions. All these cam-like joints with their individual form are responsible for the changing directional movement, which controls the distally sited skeletal structure. The distal (lower) articular surfaces of the cannon, long pastern and short pastern forming a profile to transmit motion, with the proximal ends of these bones forming the reciprocating followers.

With this concept in mind, it is my belief that as with A P Balance, the clues for determining mediolateral hoof balance, are to be found within the shape and form of the hoof-capsule itself and not the long axis of the cannon, as is popularly believed. The function of the limb as a unit greatly influences both the visible appearance and structure of the equine foot. So the hoof-capsule could be described as being the horses own forceplate; and it is only by understanding its messages that we can help the horse achieve its optimum performance.



(Fig. 1) Examples of cams used in engineering; cams change the direction of motion.

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