

inherent and inseparable from natural biomechanics.

For example, my study shows that adaptive responses by the hoof to the environment and natural trimming, such as the organic increase of mass everywhere from the hairline down, are unquestionably stimulated by the mechanism. Hence, a purely “mechanical” interpretation of the mechanism delineated by simple flexions and contractions (healthy ones!) is inadequate and fails as a model to show that more profound adaptive changes are also at work at any given time.

What I am proposing in this article is that the 3-Dimensional European Model be expanded to include a 4th-Dimension defined by organic changes: an “Organic 4-Dimensional Hoof Mechanism” if you will. Let’s begin with the 3-Dimensional Model and build from there.

3-Dimensional Mechanism

Many, if not most, farriers and vets in this country (and surprisingly in Europe too) actually harbor – consciously or unconsciously – what might be described as a “2-Dimensional” interpretation of the European mechanistic model. For example, the hoof is

simply thought to “open” and “close” 2-dimensionally behind the quarters (widest bend of the capsule) as it alternately moves through its support and flight phases (Figure 2). But, as is evidenced by the branches of well-worn shoes (Figure 3), extraordinary 3rd-Dimensional compressional forces descending from above are at work too.

Adding further to an already complicated picture, recent research by the Institute of Anatomy and Physiology at the Swedish Agricultural University,¹ shows that the capsule, while moving through its support phase, alternately uncontracts and re-contracts from the heels to the toe (page 4, Figure 4, *top*). These changes deform the entire capsule in the 3-Dimensional mechanistic interpretation (Figure 4, *center*). Moreover, the deformations occur like a pulsating, rippling “wave” across its entire mass (Figure 4, *bottom*).

That the entire capsule is subject to this compression driven, wave-like force, can only mean one thing: the entire hoof is subject to deformation – not just the bottom of it as many of us are inclined to think. Now, if we can accept this premise (and we are supported by

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¹Anderson, Ingrid. “Rubber Horseshoe In A Large Study.” *European Farriers Journal*. Dec. 1998 (75) 35-45.

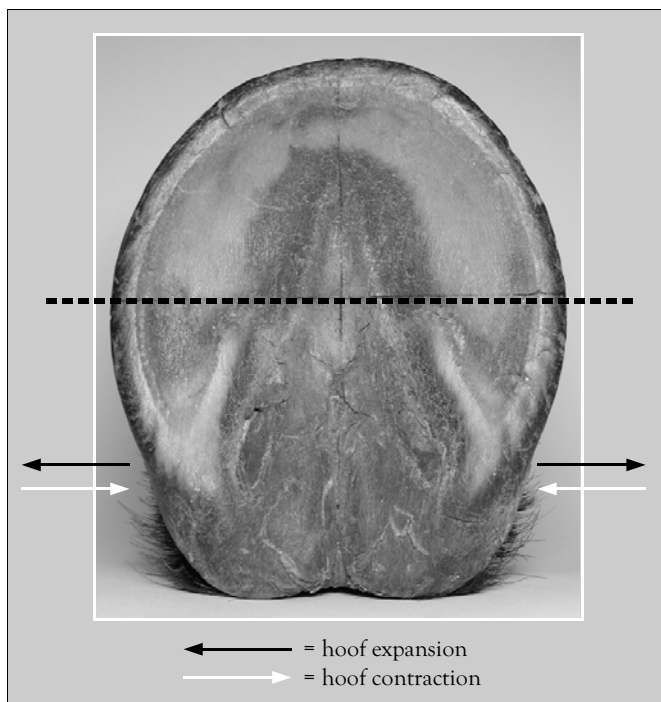


Figure 2 In the 2-Dimensional interpretation of the hoof mechanism, the hoof simply “expands” and “contracts” from side-to-side behind the widest expanse of the hoof (dashed line). Everything forward of here is thought to be essentially immovable.

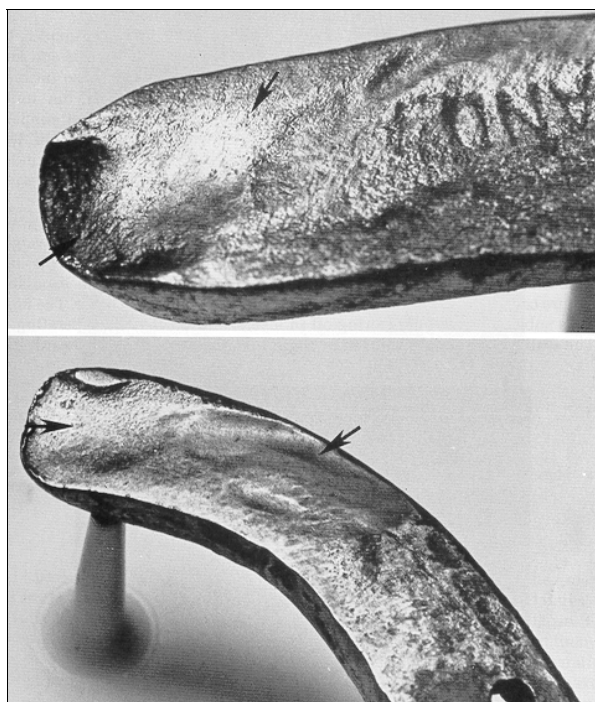


Figure 3 Grooving of shoe branches illustrate 3-Dimensional impact of weight bearing forces associated with the hoof mechanism.