In this final article on bend and flexion, we look at two counterproductive methods of using (or abusing) flexion, namely extreme hypoflexion and hyperflexion.

**Working hollow**
"Underbending" is commonly called working hollow or working in hypoflexion. There are various degrees of hollowness, but generally in this frame, a horse’s topline is concave, with his back sunken and hollow, and his head and neck raised to form a "U" shape.

A horse in this type of carriage cannot use his hindquarters effectively, since his pelvis has rotated forward (as opposed to rotating underneath him, as it does when a horse "sits" and collects), the muscles of his stomach do not work correctly to help carry the weight of his body, the vertebrae in his spine are under pressure, especially with a rider on top, and this position encourages him to shift his weight forward onto his forehand putting excess strain on his forelegs. Since he carries his neck in an unnaturally high position, it strains the muscles and neck vertebrae, and he stiffens in his poll area and tenses his jaw.

All in all, the horse is not in a position to carry a rider in accordance with classical principles since he will not be able to move correctly, freely and without discomfort.
His tense back muscles cannot swing with his movement or allow the impulsion and "schwung" created by his hindquarters to pass through his back to the front end. In fact, this blockage of energy in his back negates the very first building block of the German Training Scale, namely "losgelassenheit" or relaxation, an essential prerequisite for all further training.

The muscles throughout the body become stiff with time, affecting his willingness to work with the rider, his movement and soundness. He will not be able to collect himself and shift his centre of balance towards the rear, or be "soft in the mouth", give in his jaw and accept a light contact.

What happens beneath you
As can be seen, the long-term effects on his body and mind are damaging and any higher level of performance will be compromised. Bad conformation on the horse's behalf can predispose him to working in this frame, but generally it is achieved by pulling the horse’s head upwards and backwards with the reins, and/or riding with insufficient impulsion or lack of balance. Discomfort will also cause a horse to tense up, so accidental jerking on the reins or bumping on his back when the rider loses balance will encourage him to hollow.

Unfortunately many novice riders ride their horse in this manner, unaware of what is happening beneath them! Sometimes this frame (or variations on it) is specifically asked for by more advanced riders, usually to try to enhance movement or collect the horse, but unless the raising of the head and neck is accompanied by a lowering of the hindquarters and the maintenance of balance, rhythm, relaxation, elastic contact, impulsion and straightness, correct bend and flexion is lost and classical riding principles disappear.

Behind the vertical
The second form of extreme bend/flexion is the highly controversial "hyperflexion of the neck", riding "LDR" (long, deep and round) or "rollkur". It is important to realise that this is different to riding "long and low", "forward down out" (FDO) or "stretching the neck". There are also various degrees of riding behind the vertical (which, once again, is different to "long and low", FDO and stretching the neck).

During rollkur, the horse's face is brought behind the vertical in an extreme way. Neck flexion and bend is taken to its limits for a period of time. Proponents of rollkur ride in this way non-stop for between three and 20 minutes at a time. Rollkur's use (and abuse)
is not limited only to dressage, and is not a new invention or method.

So, although the recent focus of its use in Grand Prix and Olympic level competition has brought it to popular attention, it has been around for many years and other disciplines such as western, showing and jumping are also known to employ it.

Rollkur-related problems
The horse's neck is not designed to contract for long periods of time in the way that rollkur requires. This position injures the nuchal ligament where it attaches to the horse's skull, causing abnormal bone growth on the skull, as well as mineralisation of the ligament throughout its length as a result of excessive stress and chronic inflammation where the body tries to reinforce the area threatened by rupture from the pulling and twisting forces of Rollkur.

The horse's breathing mechanism is compromised and his oxygen supply is limited. The muscles underneath his neck are contracted unnaturally, his tongue circulation is reduced, his jaw stiffens, his field of vision is drastically restricted and makes it hard for him to swallow. His tongue is either pulled down into his lower jaw, causing it to fall forward, or it is pulled up and backwards by himself. Either way, his parotid (salivary) glands are crushed by this head position, one symptom of which is excessive foaming of the mouth.

The severe pressure on the vertebral column of the neck and spine leads to bone spurs (osteophytes) and bone degeneration due to the position of the vertebrae when placed in rollkur. The excessive bend in the neck locks the lumbar spine, leading to stiffness in his entire back and a seizure of the lumbo-sacral area, preventing the pelvis from coiling under the horse. This means that the hindquarters cannot engage and the horse tends to work on the forehand, which puts more wear and tear on the forelegs.

The muscles in the neck are also considered to overstretch in rollkur and damage is caused to them due to muscle fatigue and microscopic tears. This leads to inflexibility over time as the muscle constantly has to repair and defend itself.

The stretch induced in rollkur does not allow muscles to adjust to and relax in the stretched position, but instead causes them to tighten by repeatedly activating the stretch reflex.

What practitioners say
The use of rollkur is defended by several Olympic dressage riders, their main arguments being that it has a suppling and stretching effect on the neck, as well as being able to raise and strengthen the back, and encourage submissiveness in difficult horses, although even they point out that it should only be used by "knowledgeable trainers" for "short periods of time".

"The claimed negative mental effects are less easily proven, although its power of causing submissiveness in the horse is agreed on allround"

Whether hyperflexion is a beneficial practice or not is a hotly debated subject. There seems to be much scientific proof that rollkur is physically damaging to the horse, although rollkur practitioners passionately disagree. The claimed negative mental effects are less easily proven, although its power of causing submissiveness in the horse is agreed on allround.

Hopefully this series of articles has impressed on riders how important correct bend and flexion is, and that learning to bend your horse correctly is paramount to good riding!