

The Driving Llama

# A ROUND PEG IN A SQUARE HOLE?

by Marty McGee

Domestic animals are the  
result of artificial selection pressure.

They are manipulated by man over a period  
of time to suit a purpose or in the case of many  
companion animals, look the way we want them to look.

Llamas were selected by ancient people to carry loads without  
complaint, and to provide a source of meat, hides and wool for their  
caretakers. For whatever reason (maybe big hills and no roads), South American  
herdsmen did not decide to select for those characteristics that would make llamas  
practical for pulling. But ... North American llama aficionados are nothing if not  
impractical. As the North American llama community tests the limits of "What do you do  
with them?", we have decided to include the pulling of small carts as one of the things llamas  
can do.

Llamas are amazing creatures. They are smart, funny, endearing, they are superb pack animals and  
they produce fiber. When you ask them to do what they have been bred to do, they learn quickly  
and for the most part, they do it willingly. What happens when you ask a llama to perform work he was  
not selected to do? Is it sort of like asking a Great Dane to retrieve ducks? What is really involved in  
teaching a llama to pull a cart? Is it as easy as we are sometimes led to believe?

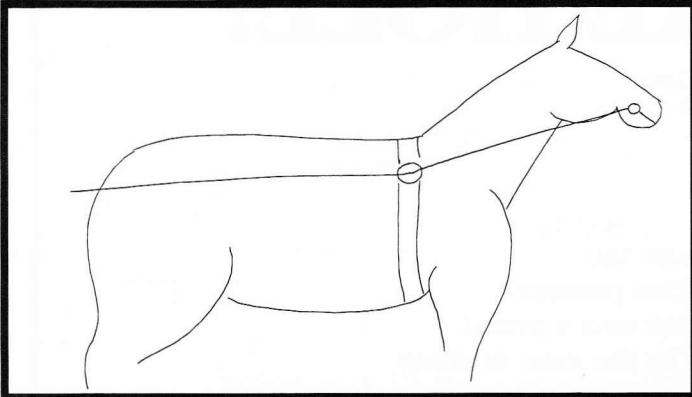
The ILA brochure *Llama Facts for New Owners* puts it this way: "Their docile nature makes llamas  
extremely easy to train to accept a halter, lead, kush (lie down), carry a pack, load in and out of a vehicle,  
pull a cart or carry a lightweight rider. With just a few repetitions they pick up and retain any of these  
skills." Can you really buy that cart, hook up ol' Fernando and toodle on down the road in a few easy  
lessons — or are you just as apt to end up in the ditch instead?

Certainly a llama can pull a cart; there are llamas doing it successfully. However, I think few people  
who have actually taught a llama to pull a cart reliably would agree that it is extremely easy or that a  
few repetitions is all it takes.

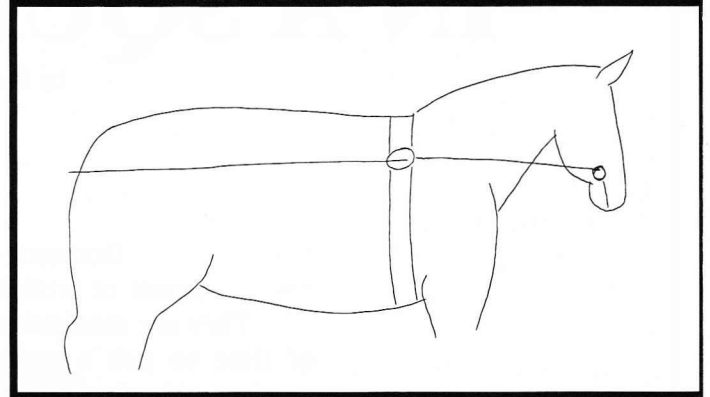
While I do not have direct experience with driving llamas, I have worked with many problem  
llamas and have fielded hundreds of questions from llama owners experiencing behavioral  
problems with their llamas. I have seen what I think is a connection, in some llamas,  
between attempts at cart training and the later development of behavioral difficulties.

In my experience, behavioral problems often arise out of a lack of understanding  
(on the part of llama **and** handler), frustration and discomfort. Perhaps a  
better understanding of the mechanics of driving and its relationship  
to a llama's physical makeup and limitations may help prevent  
problems before they start. This article is intended not  
as the last word on driving llamas, but food  
for thought — a jumping off point for further  
discussion and experimentation.

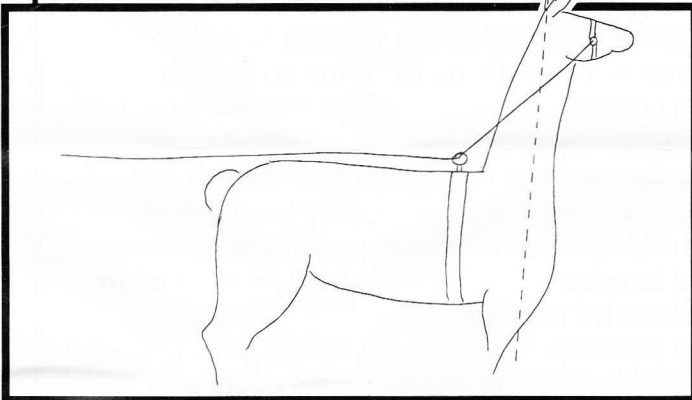
Horses have been



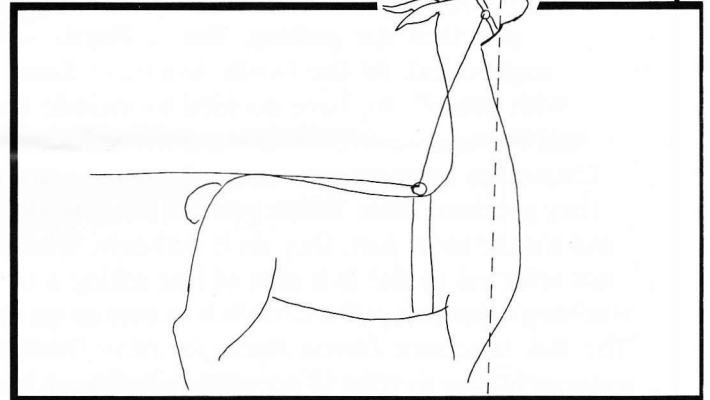
**Figure 1:** Horse is relaxed. Angle is gradual; almost a straight line to the head.



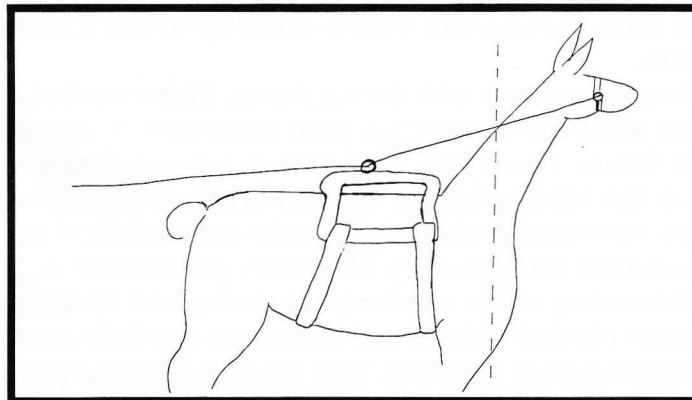
**Figure 2:** Horse is engaged. Back comes up, head drops, nose moves down and in.



**Figure 3:** Even when the llama is relaxed, the angle of pull is severe and produces much in the way of leverage and torque in the wrong direction.



**Figure 4:** Pressure on the reins encourages the llama to raise the nose and drop the back. When the llama is confused, the driver may have a tendency to get heavier handed making the problem worse.



**Figure 5:** One possible driving arrangement that would help alleviate torque problem.

selected for driving and pulling, and have been driven successfully by humans for thousands of years. Llama people have borrowed driving equipment and techniques from the horse world. I thought it would make sense to look not only at the mechanics of driving, but at the physical differences between llamas and horses, and its effect on their ability to pull a cart.

I interviewed llama owners Bobra Goldsmith and Jerry Dunn who have specific experience driving llamas. Jerry is a member of the Colorado Driving Society where she and her llamas participate in driving activities with horses. In 1989 Bobra debuted the first cart training video for llama owners. Both Jerry Dunn and Bobra Goldsmith were two early competitors in llama cart driving competition and between them, they have trained fifteen llamas to pull carts. I also thought it would be important to talk with veterinarians to get their feelings on the physical implications of llamas as driving animals. Drs. LaRue Johnson and

Joyce Harmon offered their insights. Dr. Johnson of Colorado State University is not an expert on cart training but has a vast amount of experience specifically with llamas. Dr. Harmon, in private practice in northern Virginia, has had limited experience with llamas, but specializes in sports medicine for performance horses. She is also a qualified veterinary chiropractor, kinesiologist and acupuncturist.

It makes sense to begin where the rubber hits the road, so to speak, at the feet. One of the llama's oft heralded attributes is their environmentally sound padded foot. Without a doubt a llama's foot and our increasingly delicate wilderness areas is a marriage made in heaven. On the other hand, how does a llama's soft foot hold up when it comes to pulling a cart? Everyone I talked to had reservations about the llama foot and driving particularly on pavement. Bobra Goldsmith told me, "I had a personal experience that illustrated to me that llamas do feel foot discomfort on hot pavement. I took a llama to an event. We were waiting around on hot pavement and in a fairly short time, the

llama ended up laying down to get her feet off the pavement. We moved her to the shade, of course. I think llamas can handle a certain amount of heat from the pavement if they can keep moving, but you must be very careful in a parade situation to make sure you won't get stuck on hot pavement." Dr. Harmon pointed out, "The horse has a very hard, very durable foot that is designed to travel long distances over rough terrain. However, as soon as people come into the picture, a protective covering made of steel (the horse shoe) becomes necessary. When llamas are used for packing, they are carrying weight but are moving more slowly than if they were on flat pavement, and usually the ground is more forgiving. Since it is not generally feasible to pull a cart over the type of terrain used for packing, most likely llamas would need to have some type

*"Just because someone, somewhere  
taught one Great Dane to retrieve ducks,  
doesn't mean that suddenly  
they can all do it."*

of foot protection to cope with pavement and travel roads."

In order for an animal to pull a cart, it must first wear a harness. A harness converts what is essentially a pushing force by the animal (that is the llama/horse pushes on the breast collar) to a pulling force in that the breast collar is connected to the tugs and the tugs to the cart. In order to push effectively, the animal, whether horse or llama, must learn to shift his weight to the rear and propel himself, along with cart and passengers, with his hind end. Llamas, particularly wooly ones, may look well endowed in the rear. Many llama owners are surprised when they see a shorn llama; there is simply not much back there. I asked Dr. Johnson about a llama's physical stature when it comes to pulling and he told me, "A llama's front end is their major source of propulsion and weight bearing. Most llamas are lightly muscled in the hind end. If we can extrapolate from other species, a llama with heavier rear-quarters would be more suited to pulling a cart. A llama's ability to pull a cart on grades or in loose or deep footing could be greatly compromised

by its relatively small size and small rear end."

A llama's front end anatomy is also worth taking a look at. Dr. Harmon told me, "The shoulders and chest are also important in driving horses as that is where the weight of the cart is distributed. There are two ways to distribute the weight in this area. A collar can be used to surround the neck and pressure is exerted along the front of the shoulder blade, the shoulder and the chest. The other option is a band across the chest. Llamas do not have a particularly strong chest nor do their shoulder blades lie in such a way that the harness can contact them. To complicate matters, the llama neck is set on very low and I have some concerns about the amount of pressure applied to the front of the neck by the harness. Sensitive structures pass through this area such as the trachea,

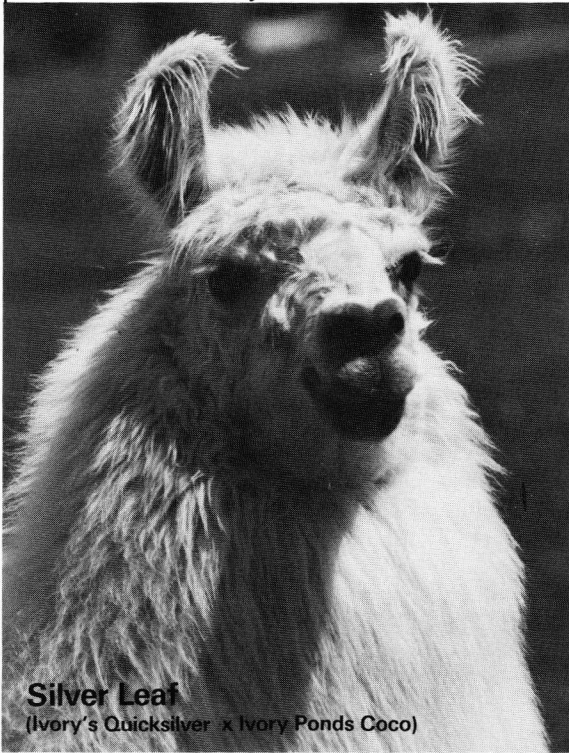
major blood vessels and the cervical spine. Excessive forces applied to an animal's structure can cause misalignment of the vertebrae, pain and dis-

comfort."

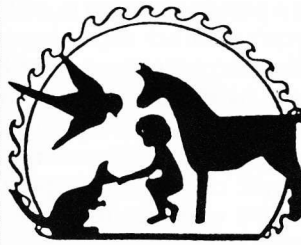
When a llama is harnessed and hooked to a cart, he is then subject to physical forces applied by various parts of the harness. The way that the harness fits and the way the lines (reins) and halter interact, profoundly affect the llama's ability to understand and then do what is asked. When a horse is asked to go forward and engage, he will typically lower his head, raise his back and push with the hind end (see Figures 1 and 2). A llama is put together much differently than a horse (a llama's neck is longer and the neck and head are attached to the body at a different angle). Often when a llama is asked to engage and move forward, a very different set of reactions take place. When the driver picks up the reins and begins to give directional signals, very often the llama will raise his head and move his neck to the rear, thus dropping his back (see Figures 3 and 4). There are several important implications of this body stance on a llama's ability to pull a cart.

Body language often expresses the way a llama is feeling. In my experience, a llama's mental frame of mind is

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often coupled with the physical body stance or frame. One is reflective of the other. When a llama puts his neck back and his nose up, his ears usually go back at the same time. This body frame is often coupled with a llama's instinctive fight-flight-freeze response. A llama forced into this body frame in a cart could be predisposed to aggression, panic or a refusal to go forward.

When a llama stands with his back dropped, his neck back and his nose up, it has a profound effect on his ability to physically perform. To get a sense of the physical forces at work, try this exercise: stand up, raise your chin and at the same time hollow your back a bit. Now raise one knee. Notice how you feel in terms of balance and freedom in your pelvis. Now drop your head, round your back and do the same thing. You should feel much more freedom of movement in the pelvis when the back is rounded and the head is dropped. Now try this variation: get down on your hands and knees, and raise your head and drop your back. Crawl forward. How do you feel? How much freedom of movement do you experience in your pelvis and shoulders. Now, drop your head, round

your back and crawl again. Do you feel the difference? Do you feel more freedom in your shoulders, pelvis and legs? Imagine pulling even a light load in the head up, low back stance? It could be that many llamas have trouble moving forward in a cart not because they are stubborn or willful, but because they are having physical difficulty and or discomfort.

I talked with Dr. Johnson about this theory and asked him to try the exercises and comment. He told me, "There is a direct correlation between what a person feels when they do these exercises and what a llama would feel. The length of the neck creates a fulcrum effect and you are looking at tremendous torque if the animal is not responsive and the driver pulls on the reins. The forces are exaggerated at the thoracic inlet (the intersection of the thorax and neck). If you watch a llama when they are hell bent to get somewhere, they run with their head down, not up high.

"We have also discovered an interesting phenomenon in the last few months regarding llamas and their reaction to chemical restraint. When a llama is fighting chemical restraint, he

will spread his legs wide apart and lower his head. It is very difficult to get these llamas to lie down even though they are very wobbly. We have found that if we raise the head and nose up, that they will lose coordination and lay down. One could infer from this that a llama is more in balance and can move more easily when his head is forward and conversely that when the head is back and the nose is up, that a llama will lose some of his coordination and freedom of movement in the rear legs particularly."

I asked Dr. Harmon to comment on back and head carriage as it relates to performance. She told me, "It is well documented in the horse world that a horse that travels with his back hollow and his head up will not be able to perform properly. As soon as a horse (or a llama) becomes hollow in the back, he loses most of his power to push from behind. Not only that, he will acquire a whole range of back problems ranging from sore muscles to vertebral misalignments. The symptoms of back pain range from minor protests to major performance and behavior problems. The conformational position of the llama's head predisposes him to becoming hollow in the back."

Anatomy notwithstanding, how does a handler teach a llama to use what power he has effectively? Jerry Dunn told me, "I like my driving llamas to have packing experience on varied terrain including steep hills. It helps them to learn to use their bodies while dealing with a load. Working on steep hills teaches a llama to get his legs under him — to collect himself. Some llamas literally try to pull a cart with their heads. Lots of time spent running and packing on a lead before ever ground driving or dealing with a cart helps them learn to use their rear ends. Even when a llama learns to use himself to pull a cart, I still think a one to three percent grade is about the maximum for long distances and that would be on a smooth surface, not in sand or loose footing."

As you might expect, when I asked about what type of llama might be best suited for driving, I received different answers. Dr. Johnson told me, "Based on the physical set up of the harness versus the length of neck, a shorter-necked llama might have less problems in harness. Not necessarily looking at way of going but at physical build for



the job of pulling, I think a wider, shorter-necked llama might be better suited for harness. In a packer you would look for depth of chest; in a driving llama width of chest and thus more area in contact with the breast collar might be an advantage."

Bobra Goldsmith told me, "I think it is important to decide first of all what you want a driving llama to do. Do you want a llama that will walk in parades or a llama that will drive along at a good clip like a horse? My personal goals are more for driving llamas that move out and can cover a lot of ground. In that case, I look for a llama that is good sized and one that has good movement. I think a longer, narrower animal with good shoulder movement and a longer stride will perform better. I look for an animal that runs with fluidity. A llama whose legs and neck are the same length and whose back is about one and a half times that long is ideal." Jerry Dunn commented, "I am looking for a 1:1:1 ratio of back to leg to neck. I also look for a good, big, intelligent eye and strong, well balanced legs. I look for proper alignment of feet and legs, and at shape and size of the feet; not too big and not too small for the rest of the body. I like an animal that is active, bright and interested. I look specifically for a lighter wool animal because I don't want to have to shear and longer wool gets in the way."

If llamas are put together differently than a horse, perhaps llama drivers are handicapped by using equipment and techniques designed for a different animal (the horse or pony). Perhaps equipment modifications such as raised terrets (the rings on the surcingle through which the lines pass), terrets placed further back on the llama's body or a combination of both may help to soften the angle from the llama's head to the handler's hands and therefore decrease the resulting torque. Using a second person in the front to help the llama find a place of comfort and learn to reach forward with his head in response to contact with the reins might also help to make driving and pulling easier for llamas. (Figure 5).

Jerry Dunn has some reservations about llama driving tack. She told me, "Horses and llamas are like apples and oranges when it comes to driving, but it is easy to fall into the trap of treating a driving llama like a horse. I have seen

individuals using whips very vigorously, wildly rattling reins and even putting bits in a llama's mouth. All of which I think is inappropriate for driving llamas. I don't think we have llama driving tack really worked out yet. We aren't there yet with the driving halter or some of the other gear, including carts. A proper cart must be well balanced and should put little to no weight on the llama's back. A four wheeled cart, while it is more cumbersome to transport, may be a much better bet for llamas." With regard to llama carts, Dr. Johnson added, "I think brakes ought to be a part of every llama cart. They can be installed. Without them you have virtually no control. I think a cart with brakes would be much safer for the passengers and if you get on much of a downhill grade, for the llama's sake you need brakes."

Bobra Goldsmith feels that training rather than anatomy or tack is the major problem. She told me, "I think most of the difficulties are related to poor training or lack of knowledge. I think many of the problems drivers experience are caused by two things. The first is that they are heavy handed. They have not yet developed a light hand. The length of driving lines only makes a heavy handed handler worse. The second thing is that most drivers don't understand their equipment or the functions of the equipment. I have seen llamas in harness and the breeching was so loose it may as well have not been there at all. Improperly fitting harness can cause discomfort and discomfort can lead to disobedience. It is not enough to know how to put a harness on; you must know how it works."

Whether it is a pony, goat, llama or horse, teaching an animal to pull a conveyance requires more in the way of animal training skills than many people have. This is not to say that one shouldn't embark on the path, but it may take longer (maybe a lot longer) for the trainer and trainee to learn together than if the trainer is experienced. Jerry Dunn is an advocate of driving "camp" for llamas. She told me, "Teaching a llama to pull a cart reliably is a real commitment. I tell people to plan on a year of training. With an untrained handler the training process may take much longer. I find that it is much easier to teach a llama to pull a cart when he is around other llamas who do it. The llamas learn by



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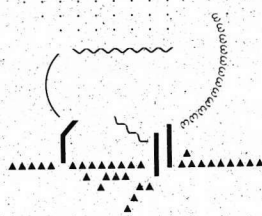
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being in a driving community. People who send their llamas away for training should also expect to spend some time with the trainer learning how to communicate with their llamas effectively through the lines."

Both Jerry and Bobra agreed that time spent ground driving is time well spent. Jerry told me, "I have talked with a lot of people who have had a llama run away with them resulting in broken bones and overturned carts. It takes time to build up trust with a llama and be able to count on him. Lots of time spent ground driving and good help when you do hook the llama up to a cart are two things that will set you up for success. Hooking a green llama to a cart in under an hour may sound impressive, but in my experience it doesn't save you time in the long run and may be dangerous." Bobra added, "It is very important for a llama to learn to respond to subtle signals on the reins and this is precisely what ground driving is for. The llama and the handler can learn to communicate via the lines without the worry of the cart."

Bobra and Jerry both agreed that driving llamas are at their best when they are out on the road. Jerry said, "Llamas are not roundy rounds! They don't think it makes sense to go around in circles and they will fight you about it." Bobra told me, "Llamas are much better on the road and they do better if you can drive two or more in company with one another. Unless they are learning something new, they get bored very quickly in a ring."

The llama with athletic ability, a good disposition, a healthy body and proper training may turn out to be a willing driver. Snaring old Pedro out of the pasture because he is not good for anything else and hooking him to a cart may net you much different results. There is a big difference between expecting a llama to perform work for which he is suited and insisting on performance from a llama that may be physically unable to do it. As Dr. Johnson put it, "Just because someone, somewhere taught one Great Dane to retrieve ducks, doesn't mean that suddenly they can all do it."

I would like to thank Dr. LaRue Johnson, Dr. Joyce Harmon, Jerry Dunn and Bobra Goldsmith for their time and insights in the preparation of this article.