Replicating Horse and Travois Travel

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ABSTRACT. A horse travois was constructed according to Hidatsa design and hitched to a modern horse representative of Indian ponies extant in the travois age. Adjusting travois width to the particular horse used was very important. Both multi-day journey and short-course experimentation on different slopes and in different terrains followed. Progress downhill proved most difficult. When riding with travois the walk was shown to be the most comfortable pace, though both jog and lope were possible. Seating postures on the travois load rack were also tested and prone positions shown to be the most comfortable and stable. Although more weight and bulk could be shifted by horse and travois than by dog and travois, the speed of horse travel was no faster. Travois poles sometimes left tracks where hooves left no trace, but these tracks were always transitory in nature; hence it seems likely no old travois trails remain extant.

SOMMAIRE. Cette étude a nécessité la fabrication d'un travois de style Hidatsa, attelé à un cheval dont les caractéristiques rappellent celles des poneys indiens de l'époque. Il s'avéra d'abord crucial d'adapter la largeur du travois au cheval utilisé; puis des essais suivirent, par tous terrains et à court terme aussi bien qu'étalés sur plusieurs jours. Le plus difficile était de négocier les descentes; autrement, le rythme le plus confortable était le pas, bien que le pas allongé et le petit trot soient aussi possibles. Des essais de posture révélèrent que la position la plus stable consistait à s'allonger sur le ventre. Bien que l'on puisse déplacer davantage de poids et de volume avec cheval et travois qu'avec chien et travois, la vitesse est comparable. Contrairement aux sabots du cheval, les timons du travois laissent parfois des traces, mais celles-ci sont éphémères: il est donc peu probable que d'anciennes pistes de travois subsistent actuellement.

Introduction

Even amongst lay people the existence and importance of the horse travois in the transport of the greatly expanded material wealth of the equestrian age Plains Indians is often recognized. However, basic travois questions have remained unaddressed. What was it actually like to ride a horse with travois, or to ride on the travois itself? How comfortable would such travel be and which horse paces would be practicable? How manoeuvrable was a horse with travois, what limitations did a travois place on routes chosen, and which slopes are negotiable with travois? What type of trail would a travois leave behind in various terrains — would there be an enduring record of passage? The following replication experiment addresses these questions.

Replication was undertaken in and on the edges of the Saskatchewan Qu'Appelle Valley. The valley is ideal for such an undertaking as it offers the raw materials for travois construction and an excellent variety of slopes and terrains to test horse and travois performance. The valley also has a variety of natural vegetation ranging from trees and bush to marsh to xeric associations of shortgrass and cactus. Typical slope ratios on the valley walls are 1:8, but steeper slopes are also found.

Horse Travois Design

The first challenge in undertaking a horse and travois replication experiment is defining what qualifies as a travois. There is disagreement and confusion on this point. Ewers (1955: 108) defines the "true" travois as "an A-shaped drag, comprising two shafts, a loading platform which is an

Figure 1. Horse, travois and rider. Photograph by Elaine Barrow.

integral part of the whole structure, and a hitch for attachment of the travois to the horse." Yet elsewhere Ewers (1955: 110) seems to consider H-shaped drags, where the two main poles do not cross above the horse's head but are hitched to the saddle and rest along the flanks of the horse, as true travois. Döring (1984: 84) would also consider those drags made by tying a temporary loading platform between two dragged bundles of lodgepoles as a third travois type. However, here I am concerned with the two permanent travois structures, the A- and the H-frame types, and the fundamental question of which came first.

The horse travois could logically have evolved from either of two origins. It might simply have been an amplification of the pre-existing dog travois (Döring 1984: 87), which would explain the A-frame style. The horse was, after all, known as "big dog" in some Indian languages. On the other hand, the horse travois might have derived from the idea of placing a load rack between two bundles of dragging tipi poles (Wissler 1914: 12), which would explain the H-frame style. Ewers (1955: 111) suspects the A-frame is the later style, at least among the Blackfoot, given its relative complexity of construction. This conjecture is congruent with one classical pattern of cultural innovation whereby groups more distant from the original source of innovation (which was presumably the southern Plains where the horse was first adopted) are less conservative in their design and application (B. Mlazgar 1995: pers. comm.). Another reason to suspect the H-frame as the earlier design is the difficulty in finding good straight poles of the extra length required by the A-frame design. The Blackfoot employed lodgepole pine to this end, but such trees would not initially have been available to many Plains inhabitants.

It is interesting to speculate whether the A-frame, which according to

Ewers (1955: 108) was known to all Plains tribes, was an inherently superior design which would have eventually superseded the H-frame given time and access to suitable trees. Certainly the A-frame had greater rigidity and strength; however, I found that the very flexibility of the H-frame loading rack made turning the horse easier. As well, the A-frame design increases the angle of contact of the dragging pole ends with the ground and thus increases drag.

A variety of woods was employed in travois construction. As stated, the Blackfoot used lodgepole pine for the main poles, and birch or saskatoon for secondary struts. However, they would use cottonwood, considered an inferior wood, for the main poles if necessary (Ewers 1955: 105-06). The Kiowa used cottonwood or cedar for the main poles (Ewers 1955: 110-11), while the Hidatsa employed green ash (Wilson 1924: 276). In the earliest account of the horse travois Hendry (Burpee 1973: 37) noted in 1754 that his Cree and Assiniboin companions employed birch, likely not an ideal wood but rather the best one available on the northern edge of the Plains.

The two detailed accounts of travois construction extant are those by Ewers (1955) for the Blackfoot and by Wilson (1924) for the Hidatsa. As the Hidatsa used a wood native to the Qu'Appelle Valley test area and as they employed the more likely original H-frame design, I built according to Buffalo-bird-woman's instructions in Wilson (1924). The only significant difference is that I built a simple load rack of cross poles according to Dakota (Winchell 1911: 434) or Kiowa (Ewers 1955: 111) tradition rather than a Hidatsa basket hoop. Unfortunately it must be noted that some of the measurements given by Wilson (1924: 275) are inconsistent one with another, while one measurement ("1 foot 17 inches") seems clearly an error. The greatest difficulty I faced in construction was finding green ash straight enough for the length of the (relatively short Hidatsa) travois poles, hence my suspicion that the A-frame design may have been dependent on access to lodgepole pine.

Travois were generally hitched to the front horn of a wooden saddle. Sometimes a strap ran underneath the belly to help secure the travois and sometimes not. An important variant was whether or not a breast strap and crupper were used. Ewers's (1955: 104) diagram shows a crupper and breast strap, plate 5 shows a breast strap only, and plate 4 shows neither. In Roe (1955) several photographs of travois in use show no breast strap but one painting by Russell includes one. Photographs in Paget (1909) and Cowie (1913) show northern Plains travois in use without breast straps and Buffalo-bird-woman in Wilson (1924) does not describe one for the Hidatsa. It seems likely the breast strap was only necessary for heavy loads. Hitching a strap underneath the horse's belly was a Hidatsa variant used when either speed or a long journey was contemplated (Wilson 1924: 276).

For the purposes of replication I used both standard Western saddles and a sawbuck or pack saddle. The travois straps hitch to the horn of the Western saddle in, for all practical purposes, the same way as they attach to the horn of an Indian wooden saddle. With the sawbuck saddle I experimented both

with and without breast strap and crupper with no noticeable impact on the horse's performance. However, I did not try to pull any very heavy loads.

Horse Selection

Indian horses were small and more correctly described as ponies. Hendry (Burpee 1973: 32), in 1754 the first to describe horses on the northern Plains, said they were "fine tractible animals, about 14 hands high; lively and clean made." Ewers (1955: 33) summarizes a composite type picture of Indian ponies: "The adult male Indian pony averaged a little under 14 hands in height, weighed about 700 pounds, possessed a large head in proportion to its body, good eyes ... large, round barrel, relatively heavy shoulders and hips; small, fine, strong limbs and small feet." Döring (1984: 65) presents a similar composite picture of Comanche and Cheyenne ponies, and ascribes their large bellies to their range grass diet. Remington states the "barrel is a veritable tun" and emphasizes the horse's practical rather than aesthetic build: the "head and neck join like the two parts of a hammer" and the mane is as likely to fall half to each side, rather than cleanly to one shoulder (Remington 1889: 339). In 1882 Richard Dodge (1970: 586-87) likewise describes the Indian pony as "averaging scarcely fourteen hands in height, he is rather slight in build, although always having powerful forequarters, good legs, short strong back, and full barrel. He has not the slightest appearance of 'blood'." Theodore Dodge (1891: 860) agrees: "He is not handsome. His middle piece is distended by grass food ... He has a hammer head and ... pronounced ewe neck."

The particular Indian ponies preferred for pack or travois use are described as "old and sedate" (Grinnell 1961: 17); old, calm and obedient (Döring 1984: 84); for the Comanches "strong, docile and serviceable" (Heriot 1807: 299); and, for the Blackfoot, ideally "a large, heavily built, strong, mare over 4 years of age. Some people preferred a former saddle horse 8 or 9 years old" (Ewers 1955: 64-65). It should be noted that using a pony (as opposed to a horse) means that the travois dragging ends lie flatter to the ground and hence ride with less friction.

Finding a suitable modern pony is not straightforward (true "Indian Ponies" per se have disappeared). However I was eventually able to acquire a 13-year-old mare of mixed blood and quiet disposition who matched the above descriptions quite closely. Standing thirteen and one-half hands high she was sturdy with straight shoulders and strong legs, a large head, a split mane, and a large belly (in fact I had to expand Buffalo-bird-woman's measurements to accommodate Tiny's range-fed belly). The only discrepancy was in her feet, which were of average size, rather than small as in Ewers's description quoted above. Although Tiny was four years older than Ewers's prescribed range for the training of former saddle horses, this difference is less significant than it might seem, given that the typical Indian pony endured a tougher lifestyle and heavier workloads than a typical modern Plains horse.

Table 1 Summary Results of Long-Course Trial					
	Travel Time Start-End (a.m.)	Temp. (°C) Start-End	Weather Conditions	Distance Travelled (km)	Speed (kph)
Day 1	6:45-10:45	16°-20°	smoke, strong head wind	15.5	3.9
Day 2	6:30-10:30	16°-23°	cloudy, calm, occasional showers	15.3	3.8
Day 3	5:15-10:30	13°-14°	overcast, fog, high humidity	18.6	3.5
Day 4	5:00-11:00	11°-11°	murky smoke, drizzle, rain, strong cross wind	20.0	3.3

Long-Course Trial

Although Tiny had never been driven she nonetheless took to pulling the travois reasonably quickly. After four weeks of training I was ready to engage her in a long course horse and travois journey. The route taken is shown in Figure 2 and the summary results for the dates of 26-29 June 1995 are shown in Table 1.

Throughout the journey Tiny was pulling the travois plus about 27 kg. Most of the time I led Tiny on foot, but some of the time I rode her as well. Weather conditions, except for day 4, were favourable to travel, that is, there

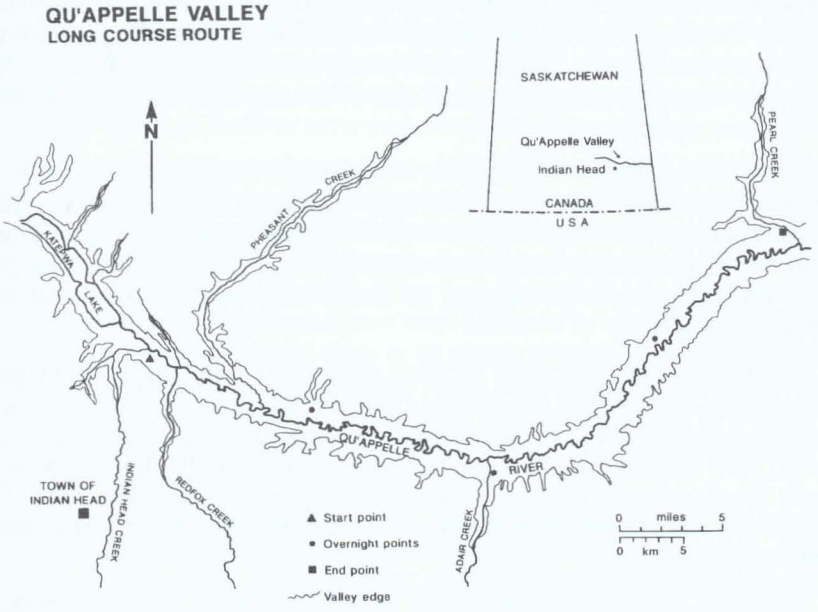

Figure 2. Map showing route followed by author.

was little direct sunlight and consequent heat problems, and the humidity was high. The latter was an advantage as this kept the ground soft and easy on the horse's feet. The rain and wind of day 4 were hard on me but not a problem of any consequence for the horse. The first three days we remained in the valley and travelled largely along dirt tracks, road easements, or through grazing pastures. We were fortunate in that flies and mosquitoes were rarely a problem. I found riding with travois to be neither faster nor more comfortable than leading the horse. The daily distances we covered were congruent with the estimates of Ewers (1955: 147) and Döring (1984: 91) for the average distance of a normal day's march using horses, although, unlike the Crow (Larocque 1934: 12, 14, 16), we did not stop for rain!

On the last test day we climbed the valley walls and tried to pick a route along the top of the valley. Eventually, however, we were squeezed out between bush and a fence line. I had to unhitch the load and then the travois from Tiny, carry each out backwards through the bush and then rehitch the horse, a time-consuming and tiring process in rain and wind. It was a good example of how poorly the travois functions in even light bush (the projecting ends of the cross poles are liable to catch on anything), as well as of the difficulty of retreat from such situations.

General observations from the long course trial and from repeated short-course trials on valley bottomlands, slopes and toplands now follow.

Observations on Foot

When leading Tiny with travois, it became apparent why the Hidatsa cut the poles so short in front of the hitch (eight inches — I initially left them longer). The short ends made walking alongside without getting a stub end in the back possible, and also made it much easier to jump in front of the travois to control the horse's head in case of trouble. It was also easier to tie the hitch on short pole ends.

One problem was the horse's side rubbing against the poles. I found that the travois width needs to be exactly right for the horse; it needs to be wide enough to clear the horse's flanks to prevent chafing, but still close to the shoulder so that riding is not unnecessarily uncomfortable. Hitching the poles higher can help in clearing fat flanks but increases friction at the dragging ends.

The travois was awkward to hitch alone but could still be managed successfully by lowering the H-frame from behind the horse and resting a short strap tied together at the front pole ends on the saddle seat. This strap would hold the two poles suspended while each pole's hitch was tied and could then be removed. The process clearly requires a calm horse. With two people it is easy to lift the H-frame main poles to either flank of the horse and to tie the hitches.

Although load rack poles needed to be retightened when too loose, I found it best to tie them down with just a little play left. This increased travois flexibility, which made it easier to turn and less likely that a pole

would break. With training, Tiny was, in fact, able to achieve a remarkably tight turning radius. This was achieved by the horse stepping across its left foreleg with the right leg and by simultaneously pushing on the left travois pole with its shoulder, in the case of a left turn. The turn is obviously easier the lighter the load pulled.

Turning downslope was difficult. Horses find it difficult to turn when their body weight is pushed forward onto their fore (turning) legs, and the travois merely added to this problem. Turning upslope was, however, relatively easy. Tiny could handle most slopes in the Qu'Appelle Valley with travois, tacking up or downslope where necessary. Again, going downslope posed greater difficulties and Tiny had to tack downslope on slope angles she would attack straight up.

Tacking downslope (or walking level along a steep slope) was where the utility of the belly strap became clear; without it the upslope pole of the travois was in danger of sliding over the back of the horse. This was less likely to happen the heavier the travois load pulled. The same bouncing over of one of the poles could happen at a trot on level ground if the ground was rough and the travois load was light. Tiny had particular trouble on muddy downslopes, where the travois would threaten to push her down the hill. It should be noted, however, that Tiny was a bit of a "flatlander" in her previous experience and not as familiar with hill slopes in general as some horses might be.

One question of great experimental interest was that of the trail pattern a travois would leave. In contrast to the old wagon trail ruts that still crisscross the Plains, drag marks from old travois use have never been identified. Part of the problem is that while the general line of an old trail route is often known, the exact route taken would vary from year to year. Repeated year-on-year use could only be expected at specific points along a given trail route, at fords or favoured campsites, for example.

How long would travois tracks be visible? Ewers (1955: 186) describes how a Blackfoot raiding party examined "tracks made by horses, travois, and footmen and noted their relative recency and direction of movement." Wooden Leg (1931: 207), a Cheyenne, describes the evidence left by large mixed tribe movements in 1876: "Our trail during all of our movements throughout that summer could have been followed by a blind person. It was from a quarter to half a mile wide at all places where the form of the land allowed that width. Indians regularly made a broad trail when traveling in bands using travois. People behind often kept in the tracks of people in front, but when the party of travelers was a large one there were many of such tracks side by side."

In general I found that hooves in dirt or mud left a more permanent record than the travois (although a travois drag mark in dirt or mud was very clear). However, the travois left a trail in grass where hooves left no trace. This travois trail of bent grass was visible for up to a few days and, interestingly, was most visible when looking backwards; hence a practiced

eye could see both trail and direction of movement, but would find it easier to follow the trail to its origin than to its destination. Nonetheless, despite repeated travois travel over the same stretch of ground (involving dirt, mud and grass surfaces) I never succeeded in creating anything approaching a permanent travois trail. All trace of passage would sometimes disappear within twenty-four hours. I had to conclude that travois poles did not leave a lasting record of passage.

Observations from the Saddle

After Tiny was comfortable being led with travois I began to ride her with travois. Stirrups have to be raised and, as the legs rest over the poles and sit higher, there is a slight loss of stability. Moving along a hill slope feels particularly unstable as the travois slides downslope; the horse compensates by pushing with its shoulder on the opposite pole. Leg aids (normally used to control and direct the horse) are, except for the lower calf and foot, no longer possible. The pressure of the poles on the inside lower thighs leads to sore spots at first, but these disappear over time.

To avoid a wide sweep it was necessary to help the horse turn by pressing down on the pole with the right thigh and releasing pressure with the left thigh in the case of a turn to the left. Travois width has to be properly sized to the horse for this to work: there is a fine line between travois poles so tight as to burr the horse and those unnecessarily wide, which make control more difficult and riding more uncomfortable. Only an imperfect compromise is possible. I found it slightly more comfortable with poles hitched to ride lower along the horse's shoulders and hence lower on the rider's thighs. In general a thin horse and a wide-hipped rider would seem the most advantageous combination.

A walking pace was reasonably comfortable and could be sustained for hours, with practice. A jog (trot) was possible but, with the legs forced wide by the travois poles, very uncomfortable at speed. Nonetheless, a slow, collected jog with the body weight pushed back and deep in the saddle (to take pressure off the pole/thigh contacts) was tolerable for short periods of time. Rising to the trot (posting) was possible but uncomfortable as the thighs cannot be used properly and there is friction from the poles; it seems extremely unlikely that posting would ever have been useful. A lope (canter) pace was feasible but far from comfortable.

Observations from the Travois

To test what it was like to travel on a travois load rack I employed two boys, one a 25 kg nine-year-old and the other a 32 kg ten-year-old. I was largely concerned with how comfortable travois travel was at different paces and which travelling postures were best. Several comfortable arrangements were discovered. These included sitting facing backwards with the legs hanging over the lowest cross pole; sitting facing backwards with the knees drawn up; sitting parallel to the cross poles with the legs extended flat on the load rack; lying parallel to the cross poles flat on the stomach

Figure 3. Author leading horse with travois and rack passenger. Photograph by Elaine Barrow.

(described as surprisingly comfortable); and lying semi-prone parallel to the cross poles facing backwards (described as very comfortable). The two prone positions also seemed very stable. Sitting cross-legged facing backwards seemed comfortable but insecure, lying on the back seemed too rough on the head, and facing forward was very unstable.

At a walking pace there were thus several relatively comfortable and secure positions. Vision from the travois was described as good and not disturbed by the travois motion. The flex of the main poles under the boys was clearly visible as the poles absorbed minor bumps. At a walking pace it was easy to jump on and off the travois. Going uphill, and especially going downhill (described as very bumpy), were less comfortable than travel on the level, and the boys sometimes lay down for security. A jog was much less comfortable than a walking pace, yet still tolerable. The faster lope was described as "exciting" and surprisingly smooth, although some of this "smoothness" was due to the travois ends flying through the air when they cleared bumps in the ground. At none of the three paces did the boys seem in danger of falling off the travois. There was no soreness reported after the trials.

Conclusions

The travois proved more comfortable to ride on horseback or on the loading rack than might at first be suspected; nonetheless this comfort disappeared at speeds above walking pace. Despite its much greater size, construction of the horse travois was simpler and took less time than for the smaller dog travois (described in Henderson 1994). Getting the travois width right was extremely important, and it would likely be best to make

Figure 4. Riding horse with travois and rack passenger. Photograph by Elaine Barrow.

adjustments for particular horses (I had to widen Buffalo-bird-woman's measurements, for example). Downhill slopes proved a greater problem than uphill slopes, but through laborious tacking it was normally possible to leave or enter the valley anywhere there were grass slopes. This would suggest that horse and travois were not more restricted by slope barriers than dog and travois; although, for the dog, uphill travel was the most difficult (Henderson 1994). Wear on the travois ends was not significant during the course of experimentation; however, it should be remembered that I did not subject it to extended heavy weighting.

It has always been clear that the horse and travois increased the weight and bulk of material goods that could be moved during seasonal migrations. However, this experiment suggests that on day marches, even if all members of a party were mounted, the speed of travel with horse and travois would not be faster than with dog and travois. The horse in a sense made a much less dramatic contribution to the pace and style of shifting camps than it did to the pursuit of buffalo and the conduct of war.

Perhaps most interesting was the transitory nature of travois tracks. From this experiment it would seem, sadly, that there are no equestrian age travois tracks waiting to be identified. While a disappointment, this is perhaps a tribute to the smoothness of travois travel and to its suitability to the Plains. For further experimentation it would be most valuable to build an A-frame travois and to test its performance; as well, it would be very useful to test travois travel under winter conditions.

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