

Carting in the Hispanic World: An Example of Divergent Development

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THERE IS AN OBVIOUS ASSOCIATION between economic growth and the appearance of increasingly specialized transport, and much of the research into the economic history of medieval and early modern Europe has dealt with this parallel development. The medievalists have studied both water and land transport, showing that the latter was often highly specialized and able to compete successfully with water-borne carriers.¹ Historians of the sixteenth through the eighteenth centuries, however, have tended to accept Fernand Braudel's dictum that by 1600 land transport was overshadowed by improving shipbuilding and navigational techniques.² As a result, they have concentrated their energies on the latter and given little attention to land transport, except as associated with the beginnings of the industrial revolution in England. This tendency has obscured the fact that until the introduction of railroads, Europe went through repeated episodes of regional economic growth which depended almost entirely on overland transport consisting of professionalized carters and muleteers.

Spain and her American empire witnessed at least three such episodes: in Mexico, 1540-1600, in Castile, 1750-1800, and in Argentina, from about 1770 to the middle of the nineteenth century. The interior of the Iberian peninsula, the Mexican plateau, and the pampas of the Argentine were all large inland areas restricted to the use of land transportation. The transport of these regions developed from the technology of late medieval Spain and supported significant economic growth for considerable periods. Obviously one must avoid implicit comparisons with the headlong growth of industrialization.

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¹ R. J. Forbes, *Studies in Ancient Technology* (2 vols., Leiden, 1955), II, 159-160; R. D. Face, "The *Vectuarii* in the Overland Commerce Between Champagne and Southern Europe," *Economic History Review*, 2nd series, XII (1959), 239-246; Robert S. Lopez, "The Evolution of Land Transport in the Middle Ages," *Past and Present*, No. 9 (1956), 27-28.

² Fernand Braudel, *La Méditerranée et le monde méditerranéen à l'époque de Philippe II* (Paris, 1949), 245.

The episodes in question resemble, rather, the growth periods of agrarian Europe during the twelfth, sixteenth, and eighteenth centuries. In Castile this development emphasized the growth of Madrid and an increase of regional specialization in manufacturing and agriculture. The Mexican case was associated with the wealth of the silver mines, the Argentine with the growth of the cattle industry.

In each of the regions being considered demands arose for two functionally distinct types of transport service. The greater part of transport activity was involved in seasonal exchanges of wheat, wine, charcoal, and rough textiles, all essential for even a relatively self-contained community.³ This transport for subsistence exchanges was fundamentally unspecialized. Since the transfer of such goods was seasonal or casual, the carriers commonly used idle farm resources—their own labor, mules, and less often carts. Pack-animal carriers could normally provide only limited services beyond regional exchanges of produce for immediate consumption, because for much of the year they had to participate in farming. Often, too, the cargoes required by more complex economic activity could not be carried on pack animals.⁴

Economic growth and development, therefore, demanded more than seasonal muleteers could provide: greater specialization, release from the requirements of the farming cycle, the ability to carry goods which could not be transported on animals alone, and reasonable unit costs for freight relative to its importance.⁵

A part of these specialized transport services was provided by professional muleteers (*arrieros*), who appeared throughout the Spanish Empire during the entire period being considered. This professionalized mule transport reached its greatest development in the region of modern Ecuador, Peru, and Bolivia.⁶ Here convoys of

³ A typical pattern of such exchanges, set in sixteenth-century Castile, is outlined by José Gentil da Silva, *En Espagne, développement économique, subsistance, déclin* (Paris, 1965), 1-57.

⁴ This imperfection in the supply of transport services is discussed briefly in David R. Ringrose, "Transport and Economic Stagnation in Eighteenth-Century Castile," *Journal of Economic History*, XXVIII (1968). It is described in more detail in David R. Ringrose, "Transportation in Eighteenth-Century Castile" (Ph.D. dissertation, University of Wisconsin, 1966), Chapter III.

⁵ The most obvious demands for specialization were posed by the need to move ship timbers in Spain and mining machinery in Mexico. AHN (Archivo Histórico Nacional, Madrid), Consejos, legajos 2293-4, 2733-24, 2016-17; Philip Powell, "The 49'ers of Sixteenth-Century Mexico," *Pacific Historical Review*, XIX (1950), 239-249.

⁶ Gwendolin B. Cobb, "Supply and Transportation for the Potosí Mines, 1545-1640," *HAHR*, XXIX (1949), 24-45.

hundreds of animals moved toward Potosí from all directions every day. Argentina exported thousands of mules each year to Peru for transport and use in the mines.⁷ Despite the tremendous obstacle of the Andes Mountains, the Spaniards were trying to accomplish what Bert Hoselitz calls "the commercialization of primary production" with extremely primitive transport techniques.⁸ For a time this was possible because the primary products involved—silver and mercury—had high intrinsic value, but the tremendous costs go far to explain why the fabled wealth of Peru made relatively limited contribution to the Spanish royal finances. The volume of bullion which the Spanish actually got out of Peru was no small tribute to their organizational and entrepreneurial skills. Elsewhere in Spanish America, especially in Panama and Guatemala, pack animals were used on significant land routes, but on a smaller scale or over much shorter distances.⁹

In Spain, Mexico, and Argentina, however, more developed transportation appeared, derived from the carting techniques of medieval Castile—an important and little-known example of America's medieval European heritage.¹⁰ Numerous travelers have reported long trains of two-wheeled carts, creaking along behind oxen or mules across the plains of Castile, the plateau of Mexico, and the pampas of Argentina. The specialized cart transport of all three areas and periods was associated with economic development. The cart transport decayed with the decline of seventeenth-century Mexico and

⁷ Concolorcorvo (pseud. for A. Carrió de la Vaudera), *Itinéraire de Buenos Aires a Lima* (Paris, 1961), 90-103.

⁸ See Bert F. Hoselitz, "The Scope of State Intervention," Chapter 11 in Hugh Aitken (ed.), *The State and Economic Growth* (New York, 1959).

⁹ For Panama see *Recopilación de las Leyes de Indias, lib. IV, tit. 17, ley 4*; J. H. Parry, *The Spanish Seaborne Empire* (New York, 1966), 130; A. C. Loosley, "The Puerto Bello Fairs," *HAHR*, XIII (1933), 314, 320-322. For Guatemala see: R. S. Smith, "Indigo Production and Trade in Guatemala," *HAHR*, XXXIX (1959), 199; Troy S. Floyd, "The Guatemalan Merchants, the Government, and the Provincianos, 1750-1800," *HAHR*, XLI (1961), 94. For Colombia see E. Taylor Parks and Alfred Tischendorf (eds.), "From Cartagena to Bogotá, 1825-26: The Diary of Richard Clough Anderson, Jr.," *HAHR*, XLII (1962), 217 ff.

¹⁰ Weckmann and White, for example, ignore it in their speculation on cultural transplants. Luis Weckmann, "The Middle Ages in the Conquest of America," *Speculum*, XXVI (1951), 130-141; Lynn White, "The Legacy of the Middle Ages in the American Wild West," *Speculum*, XL (1965), 191-202. A much more fruitful approach to this problem is exemplified by the work of C. J. Bishko, "The Castilian as Plainsman: The Medieval Ranching Frontier in La Mancha and Extremadura," in A. R. Lewis and T. F. McGann (eds.), *The New World Looks at Its History* (Austin, 1963), 47-69, and "The Peninsular Background of Latin American Cattle Ranching," *HAHR*, XXXII (1952), 491-515.

nineteenth-century Spain, while it made possible growth in the Argentine economy before about 1810 and increased economic dominance by Buenos Aires thereafter. The technology of these three carting industries had a common source, late medieval Spain; yet three distinctive patterns appeared. Given the common culture of the Hispanic world, how similar were these three industries in their technology and organization? What passive conditions permitted their development, and what actually brought them into existence? What kinds of economic activity could they support and how did such carting respond to differing and changing economic circumstances? This study will suggest tentative answers to these questions.

The carting industries which appeared in Mexico, Castile, and Argentina had a common origin, but developed to meet varying local conditions. In all three areas certain basic factors were present: 1) geographical conditions which allowed the use of wheeled vehicles; 2) the carting techniques of medieval Spain; 3) some sort of subsidy or source of wealth to support economic growth despite the high costs of land transport;¹¹ 4) a demand for transport services which were free of the seasonal and load limitations typical of most pack animal transport; and 5) some suitable combination of capital, animal power, and grazing resources which would support an extensive carting industry.

The relative importance of these factors varied considerably in each of the three areas, and the overall combination appears to have been least favorable in Spain. There geography was a handicap, for the level plateau areas are less extensive than in Argentina or Mexico. Mountains or rugged highlands cut up the interior plateaus and separate them from all coasts, posing a ubiquitous barrier to wheeled transport. This relatively rugged Spanish terrain helps to explain the type of cart commonly used.

The carting of Spain, Mexico, and Argentina all developed from the simple two-wheeled cart of medieval Castile. This cart consisted of three longitudinal timbers, the center one extending forward beyond the body of the cart as a shaft to which the draft animals were yoked. Transverse ribs held together the longitudinal beams, and the whole was covered with a flat bed of wood, woven fiber, or netting. The sides consisted of vertical stakes or boards. This medieval cart had two types of running gear. One version used relatively small wheels of heavy timber, nearly solid and rimmed with replaceable wooden strips.

¹¹ On Castile, Earl J. Hamilton, *War and Prices in Spain, 1651-1800* (Cambridge, 1947), 252; AHN, Consejos, legajo 11452. On Argentina, Concolorcorvo, *Itinéraire*, 76.

In this type wheels and axle were locked together, the axle turning in mountings under the bed of the cart. The second variety was built with larger, lighter, spoked wheels, often with metal rims or cleats for traction. The wheels in this case had large hubs fitting over the axle, which was fixed to the bed of the cart with the bearing surfaces in the wheel hubs.¹²

Although both types of cart long remained in use in Spain, the rough terrain caused the professional, long-haul freighters to favor the first version with small, heavy wheels—the *carreta*. These carts were typically lower and more stable than those with spoked wheels, and were generally pulled by two oxen, with a third kept in reserve. They were rugged, easily repairable with a few simple woodworking tools, and capable of carrying many cargoes which pack animals could not handle.¹³ The lighter, spoked-wheel cart was used primarily for farming and short hauls.¹⁴ The typical Castilian freighting cart carried up to 1,000 pounds (40 arrobas) of cargo at a rate of ten to twelve miles per day.¹⁵ The professional carters generally organized their carts into trains of twenty-five to thirty vehicles which traveled as much as 1,000 miles a year, ranging from one end of Spain to the other.¹⁶ A few larger four-wheeled wagons appeared in the Southeast, where the terrain was better, but elsewhere carters failed to use such vehicles until well into the nineteenth century.¹⁷

Not only was the *carreta* suitable to terrain and existing roads; it also corresponded well to the combination of capital, animal power, and grazing resources prevailing in Spain. Few cart owners had much capital—even in the provinces where carting was best developed

¹² Gonzalo Menéndez Pidal, *Los caminos en la historia de España* (Madrid, 1951), 56, 76-78.

¹³ *Ibid.*, and José Tudela de la Orden, "La Cabaña de carreteros," in *Homenaje a Don Ramón Carande* (Madrid, 1963), 357-358. Also, AGS (Archivo General de Simancas), Catastro, libro 14—Burgos: Palacios de la Sierra.

¹⁴ AGS, *Ibid.*; Tudela, *Ibid.*

¹⁵ AHN, Consejos, legajo 230-6; AGS, Secretaría de Guerra, legajo 416; Archivo del Ayuntamiento, Navarredonda de la Sierra (Ávila), Libro de Acuerdos, 1755; Antonio Matilla Tascón, *Historia de las minas de Almadén* (Madrid, 1958), I, 160.

¹⁶ Julius Klein, *The Mesta* (Cambridge, 1920), 22-23; Tudela, "Carreteros," 357-359.

¹⁷ Regional census of vehicles, 1753, in Archivo del Ayuntamiento, Murcia (Spain), legajo 2795, and also Archivo del Ayuntamiento, Cartagena (Spain), Libro de Rentas, 1696. The prevalence of traditional transport techniques was noted in 1826-1827 by Alexander S. MacKenzie, *A Year in Spain by a Young American* (Boston, 1829), 174-175, 204, and in the 1840s by Richard Ford, *Handbook for Spain, 1845* (London, 1966. This is a three-volume reprint of the 1845 edition), III, 1362-1365, I, 479.

they averaged little more than five carts apiece, while the national average was closer to three.¹⁸ The thirty-unit wagon train of Castile, therefore, represented temporary partnerships among small-scale owners who had pooled their vehicles under professional crews and managers to reduce labor costs.¹⁹ Spanish cart owners simply could not afford the six or more oxen or mules required for a single *carro* of the Mexican type. Anyway such a *carro* would have been impracticable for Castilian topography, and available draft animals were badly needed for Spanish agriculture, especially during the sixteenth and eighteenth centuries.²⁰

Finally, the price of draft animals and the overall cost of freight-ing depended heavily on the availability of grazing.²² Spain was an old and complex society, and every piece of grazing was either occupied or subjected to overlapping claims. The town commons were vital to local livestock as well as to carters in transit; rental pastures for the winter were coveted by sheep herders and cattle ranchers; and grazing and winter fodder were scarce in the mountain homes of the carters. Grazing land, therefore, was relatively limited when compared with that of Mexico or Argentina, and the rising population of the later eighteenth century complicated the situation by causing pressure for enclosure.²²

The only factor capable of overcoming these unfavorable conditions was a strong demand for specialized transport, and this appeared as the economy of eighteenth-century Castile evolved. Three causes produced this demand: the expansion of agrarian export activity in wool, hides, wheat, and flour; the growth of defense industries; and urbanization concentrated on Madrid. The oldest need for transport was to carry wool to the seaports, an activity going back to the

¹⁸ Ringrose, "Transport and Stagnation," 69. This varied between provinces from 1.49 in Granada to 4.96 in Burgos and 7.33 in Soria. Taken from statistics extracted from AGS, Catastro, libros 1-670, relating to the period 1750-1752.

¹⁹ AGS, Catastro, libro 14—Burgos—Ontoria del Pinar; AHN, Consejos, legajos 211-3, 1733-24, 2868-25; Tudela, "Carreteros," 355-359, 385-387.

²⁰ As it was, animals were the most expensive part of a carter's equipment. In 1739 the cart train of the Duke of Medinaceli reported the value of its fifty oxen at an average of 300 reales each. In the course of that summer six carts were purchased for forty reales each. By 1806 untrained carting oxen cost 700 reales each. Archivo del Duque de Medinaceli, Casa de Piloto (Seville), Estado de Medinaceli, legajo 60-83, 84; Tudela, "Carreteros," 385-387.

²¹ AHN, Sección de Hacienda, libro 8038, folio 351.

²² The pressure on transit pastures is evidenced by a number of disputes over such matters in the 1790s. The pressure on winter pastures continued to grow from the 1740s, on, reducing some special preserves by half. AHN, Consejos, legajos 1555-2, 1604-13, 1608-1, 2306-23, 51197-22.

Middle Ages.²³ To this were added the requirements of defense—transport for campaigns, for the transfer of guns and ammunition, and for the movement of ship timber from interior forests to the coast.²⁴ The third type of demand for specialized transport was to carry foodstuffs, building materials, and other goods to Madrid. This developed strongly in the seventeenth century, and in the eighteenth it came to overshadow the others. The growth of Madrid, as the capital, was a function of governmental expansion; by 1800 the city was approaching 200,000 inhabitants. It drew commodities from almost all of Old and New Castile and had no means of supply other than carts and pack animals.²⁵ By the 1780s the needs of Madrid and the other demands mentioned had brought into existence an extensive professional carting industry.²⁶

This transport, however vital, was expensive. Through three different techniques the royal government had to use its power and resources to support the carting on which its administration depended. The crown gave the carters an elaborate system of economic privileges, especially the use of town commons and guaranteed, low-rent winter pastures.²⁷ It also established a special juridico-administrative agency to protect and enforce carting laws. By 1780 this involved a central judge, dozens of local judges, and subsidized legal aid. Finally, in crisis years the crown subsidized transport outright by buying grain directly, paying for its transport at current fees, and selling the delivered grain below cost.²⁸

In general, therefore, Castilian carting, though limited to small and primitive ox carts and hampered by scarce resources, expanded in the seventeenth and eighteenth centuries. This was due to a rising demand for defense and especially to the development of Madrid

²³ Existing royal documents on the matter go back at least as far as 1487 and most likely beyond. AGS, Registro del Sello, 1487, doc. 22.

²⁴ The government rented cart trains for the wars against Granada (1480-1492), Portugal and Catalonia (1640-1668), and Napoleon (1808-1812). AGS, Sello, various documents from 1481-1492; Archivo del Ayuntamiento, Navarredonda, Libro de Actas, 1641; Tudela, "Carreteros," 354-355.

²⁵ AHN, Consejos, legajos 1843-2, 49240; Archivo del Ayuntamiento, Murcia, legajo 2795; Jaime Vicens Vives, *Historia de España y América* (5 vols., Barcelona, 1961), IV, 160. In drought years it was even necessary to haul imported grain from the seaports.

²⁶ In the 1750s Castilian carting already included some 4,000 cart owners and about 12,000 carts. Based on statistics extracted from AGS, Catastro, libros 1-670. See: Ringrose, "Transport in Castile," Chapter III.

²⁷ *Novísima Recopilación de las Leyes de España*, libro 7, tit. 28, leyes 1-6. The hidden taxes in this arrangement are obvious.

²⁸ The legal position of the carters is summarized in Ringrose, "Transport and Stagnation."

as a center for administration and consumption. The costs of this expanding transport were met by crown subsidies, direct and indirect, rather than by any great increase in the wealth of Castile.

The Mexican pattern was very different. Here the great age of carting came much earlier and in a more glamorous setting—the boom period of silver mining. The geographic problems which confronted Mexican carters were, in many ways, more favorable than in Castile, although there were some formidable obstacles. The Mexican plateau, stretching to the north and west of Mexico City, offered level terrain over long distances, except where cut by great barrancas. These ravines and the mountains in which most mines were located required expensive bridge and road construction to allow wheeled transport. Even more difficult was the route from Mexico City to Veracruz, which involved a drop of several thousand feet in elevation and required really substantial outlays of capital for roads.²⁹

But the real difference between Spain and Mexico lay in the nature of Mexican demand. During the mid-1540s Mexico suddenly acquired the richest silver mines in the world. The next thirty years brought rapid economic development and expansion, as Spaniards sought out the great silver deposits of the interior against the fierce resistance of the Chichimeca Indians.³⁰ Less spectacular but equally important was the development of ranching and plantation farming in some areas, producing food for the mining regions and sugar and hides for export.³¹

These activities required transport which could easily and efficiently handle large quantities of mining and refining machinery, and heavy or bulky supplies (including salt, mercury, lead, firewood, and mine timbers) and carry as return cargoes the silver, sugar, and other products of the interior. Moreover, all cargoes needed reasonable security on a dangerous frontier.³² Hence the development of the large Mexican *carro*, often drawn by huge teams of mules.

²⁹ Scattered examples of government action on road maintenance are published from AGN (Archivo General de la Nación, México), General de Parte, II, 36v-37, 114v, 162-162v, V, 50, 52v, found in Silvio Zavala and María Castelo, *Fuentes para la historia del trabajo en Nueva España* (5 vols., México, 1939-1940), II, 187, 240, 281, IV, 288, 289. Development of the Spanish road network in Mexico is sketched by Philip W. Powell, *Soldiers, Indians, and Silver: The Northward Advance of New Spain, 1550-1600* (Berkeley, 1952), 17-21; Philip W. Powell, "Presidios and Towns on the Silver Frontier of New Spain, 1550-1580," *HAHR*, XXIV (1944), 181-182; Powell, "The 49'ers," 238-239.

³⁰ Powell, *Soldiers, Indians, and Silver*, 61-66; Powell, "Presidios," 180-181; J. Lloyd Mecham, *Francisco de Ibarra and Nueva Vizcaya* (Durham, 1927), 34.

³¹ François Chevalier, *Land and Society in Colonial Mexico* (Berkeley, 1963), vii, 63-64.

³² Powell, *Soldiers, Indians, and Silver*, 25.

Both types of Spanish cart were introduced very early into Latin America, and both were widely used in sixteenth-century Mexico, much as in Spain.³³ During the 1550s, however, a new vehicle was introduced in Mexico—to all appearances a very large, spoked-wheel Spanish freighting *carreta*. The probable source of this innovation was one Juan Carrasco, a professional carter on the routes from Mexico City to Zacatecas and Veracruz. In a petition dated 1576 Carrasco claimed credit for inventing the large *carros* and for introducing them to the main routes. This large cart had a capacity four times that of the *carreta* and required up to sixteen mules in a team when heavily loaded.³⁴ Covered with heavy planking and studded with spikes and clamps, such *carros* could serve as rolling block-houses for protection against hostile Indians.³⁵ Only these juggernauts could carry the heavy equipment required by the mines and withstand Indian attacks.³⁶ Response to needs and environment also explains the frequent use of mules instead of oxen in Mexico, since mules are faster, minimizing delays and exposure to attack.

Once brought into existence, the *carros* and their mules could compete with other modes of transport to haul foodstuffs for Mexico City, and other centers, but the factor of overriding importance was always the need to service the mines. The carting industry which resulted, like that of Castile, was independent of the agrarian cycle, but it arose in response to requirements very different from those which had prompted the development of Castilian carting.³⁷

The combination of capital, animal power, and grazing resources in Mexico also contrasted strikingly with that of Castile. Plentiful grazing meant cheap animal power. Not only was much grassland unoccupied, but the government aided the carters by introducing the system of town commons and requiring every town to provide them

³³ William H. Dusenberry, *The Mexican Mesta* (Urbana, 1963), 87; Powell, "The 49'ers," 240; Powell, "Presidios," 181-182, note 5.

³⁴ One traveler of the 1840s compared the carro with the wagons of the American west, which carried 4,000 to 5,000 pounds of cargo. See Powell, *Soldiers, Indians, and Silver*, 149-50; Albert M. Gilliam, *Travels Over the Table Lands and Cordilleras of Mexico During the Years 1843 and 1844* (Philadelphia, 1846), 204-205; Oscar O. Winther, *The Transportation Frontier: The Trans-Mississippi West, 1865-90* (New York, 1964), 32.

³⁵ Powell, *ibid.*, and Powell, "The 49'ers," 239. Similar carts were described in Mexico as late as the 1840s.

³⁶ Dusenberry, *Mexican Mesta*, 35-36; Powell, *Soldiers, Indians, and Silver*, 61, 66; "Presidios," 180-181.

³⁷ Chevalier, *Land and Society*, 108, maintains that sixteenth- and early seventeenth-century Mexico had a high level of circulation of consumer products and some regional specialization of labor.

free grazing.³⁸ Soon after their introduction cattle and horse ranching assumed major proportions.³⁹ If the price of beef in Mexico City is an indication, the animal supply had caught up with demand by the 1540s.⁴⁰ Moreover, agriculture did not compete for draft animals as much as in Castile. The Indians did not use animals, and needs of the small Spanish population did not begin to offset the effect of the decline in the native population.⁴¹

Mexican carters frequently used mules, probably because the unusually high intrinsic value of the silver cargoes made speed important enough to justify the resulting marginal increase in costs. For less urgent transport the ox remained an important draft animal. While the ordinary Castilian cart train included carts of several small proprietors, those of Mexico seem to have been the property of single individuals with access to capital on a scale unknown in Spain. We learn of trains comprising thirty to eighty large *carros* owned and operated by individual Spaniards using Indian labor.⁴² This apparent availability of capital is clearly part of the explanation for the high level of development achieved in Mexican carting.

The wealth of the mining industry also provided capital at other key points which facilitated cart transport. The government used some of its mineral revenues to provide military protection and road construction, making possible the use of the large *carros* on a route from Veracruz to Santa Fe in New Mexico, one of the longest wagon roads of the sixteenth-century world. Along the highways to the mines were government built forts and garrisons, while cart trains included armored wagons and military escorts.⁴³ Of vital importance was the link between Mexico City and Veracruz. Constructed at great expense, this road facilitated the import of machinery, mercury, and other supplies for the mines. Its existence indirectly aided cart-

³⁸ *Recopilación de las Leyes de Indias*, lib. IV, tit. 17, leyes 5, 7. See also: Chevalier, *Land and Society*, 87-88.

³⁹ Mecham, *Francisco de Ibarra*, 208; Dusenberry, *Mexican Mesta*, 179-180; Powell, "The 49'ers," 240; Eusebio Francisco Kino, S. J., *Kino's Historical Memoir of Pimería Alta, 1683-1711* (Berkeley, 1948), II, 267.

⁴⁰ Chevalier, *Land and Society*, 92-93, says that by the 1540s cattle had become very cheap and that meat prices in Mexico City fell seventy-five percent from 1538 to 1542.

⁴¹ Sherburne F. Cook and Lesley Byrd Simpson, *The Population of Central Mexico in the Sixteenth Century* (Berkeley, 1948), *passim*.

⁴² On the size of cart trains, see: Mecham, *Francisco de Ibarra*, 99; Chevalier, *Land and Society*, 14; AGN, *General de Parte*, IV, 184v in Zavala, *Fuentes IV*, 426. On the use of Indian labor in wagon trains, AGN, *General de Parte*, III, 41v, VI, 116, 136-136v in Zavala, *Fuentes*, II, 10-11, V, 9-12.

⁴³ Chevalier, *Land and Society*, 291-292, considers that the mines were the source of support for transport.

ing, because it reduced the idle seasons by providing work in the winter months when the climate near the coast was favorable while in the interior it was not.⁴⁴

The Mexican carting industry clearly benefited from favorable natural resources in comparison with Spain. The terrain on the plateau was favorable; the interior offered vast and cheap grazing lands, lands which quickly generated a plentiful supply of animal power. These, however, were relatively passive factors, and the really dynamic sector of Mexican economic development was the silver industry. Directly, this produced an urgent, specific type of demand while also providing capital to develop transport on a considerable scale. Indirectly, the presence of the mining towns in barren areas created markets, assuring transporters a wide range of cargoes.⁴⁵

Cart transport in the Argentine was generally similar to that of Mexico. It differed, however, in that geographic conditions were more favorable, while the economic factors supporting it did not provide the volume of capital and the intense demand created by the Mexican mines. Most Argentine carting took place in a roughly triangular area extending from the Río de la Plata to Mendoza, Tucumán, and Jujuy.⁴⁶ Within this area, the terrain is generally level, and in dry weather transport required little more than a trail to follow and regular watering places. The only notable obstacles in the region were one or two difficult river crossings, some long stretches without water, and some forested routes in the northwest.⁴⁷ Conditions were thus suitable for any vehicle strong enough to stand up on the rutted trails and simple enough to be repaired without metal-working equipment.

The *carro* adopted in Argentina resembled that of Mexico in appearance and the *carreta* of Castile in structure. According to an unusually detailed description of 1776: the cart wheels were nearly seven feet in diameter, with hubs of solid wood one and one-half to two feet thick. Through the hubs passed an axle about twelve feet

⁴⁴ References to such seasonal patterns appear in AGN, General de Parte, V, 184v, 185v, in Zavala, *Fuentes*, IV, 426, 428.

⁴⁵ J. H. Parry, *The Audiencia of New Galicia in the Sixteenth Century* (Cambridge, 1948), 49, describes the soaring prices of early Zacatecas. According to Chevalier, *Land and Society*, 63-64, by the 1560s prices in the mining areas had stabilized at a more reasonable level.

⁴⁶ Horacio Giberti, *Historia económica de la ganadería argentina* (Buenos Aires, 1954), 49; Rodolfo Puiggrós, *Historia económica del Río de la Plata* (Buenos Aires, 1948), 44-45; Concolorcorvo, *Itinéraire*, 47.

⁴⁷ Pedro Santos Martínez, *Historia económica de Mendoza durante el virreinato (1776-1810)* (Madrid, 1961), 117-118, 249-254; Concolorcorvo, *Itinéraire*, 65.

long, which supported the bed of the cart. This consisted of three longitudinal poles, the center one almost twenty-one feet long, those on the sides only twelve feet. The three poles were connected by four ribs, forming a frame slightly over four feet wide by twelve feet long. Each side had six posts which carried bows of bent wood covered with sewn cowhides to form a roof. The sides were covered with rush mats, and the floor consisted of a heavy net or stretched, resilient hides. From ground to floor was four feet, from floor to roof, six and one-half feet.⁴⁸ Some vehicles, called *carretones*, were built with solid plank sides.

A cart of this type was normally pulled by two pair of oxen. The nearer pair wore a yoke about seven feet long which fastened directly to the end of the central shaft. The lead oxen were similarly yoked, but attached to the shaft by a massive "quadruple" cable of solid, braided bullhide. The lead oxen, a good twenty feet from the driver, were driven with a goad on a long pole mounted on the cart's roof and so balanced that it could be managed with one hand. This left the driver's other hand free to drive the nearer oxen with a short goad.

The carts of Tucumán normally hauled 150 arrobas (3,750 pounds) of cargo, those of Mendoza, which traveled over better terrain, 178 arrobas (4,450 pounds). In addition, each carried a large jar of water, supplies of wood for cooking and cart repairs, a driver, and his belongings. The contents thus totaled 200 to 228 arrobas (5,000 to 5,750 pounds) on long trips. The carts were made entirely of wood, without a trace of hardware. Since the bearing surfaces in the wheel hubs were also wood, they had to be greased every day to prevent wear.

These carts became common in the Argentine with the prosperity of the late eighteenth century, and they continued to be important for freight hauling well into the nineteenth. Writing in the 1850s, Victor Martin de Moussy called them the principle mode of transport across the pampas and rated their capacity at 1,800 kilograms (3,960 pounds), when pulled by six oxen.⁴⁹

Supplies of grazing and livestock were, if anything, more plentiful than in Mexico. The vast, unsettled pampas supported a huge cattle

⁴⁸ Concoloreorvo, *Itinéraire*, 1, 74-77. Pictures of these carts are printed in Santos Martínez, *Mendoza*, facing p. 320, and in Laurio H. Destafani and Donald Cutter, *Tadeo Haenke y el final de una vieja polémica* (Buenos Aires, 1966), facing p. 90.

⁴⁹ Victor Martin de Moussy, *Description géographique et statistique de la Confédération Argentine* (3 vols., Paris, 1860-1864), II, 566-567.

population which effectively reduced the price of oxen to the export value of their hides. Relative to this, mules were a valuable commodity in Argentina, since they were in constant demand at the Peruvian mines. As a result, oxen were generally used for carting.⁵⁰

It appears that in Argentina capital available to develop a carting industry was more limited than in sixteenth-century Mexico. The presence of guilds in Tucumán and Mendoza suggests that carters had to band together for political and economic leverage.⁵¹ Moreover, accounts of carting here explicitly describe an industry of small owners, less specialized and more seasonal than those of Castile or Mexico.⁵²

These conditions reflect the relatively diffuse demand for transport in the Argentine, a situation which Spanish trade restrictions long encouraged. By 1800, however, this trade included 1) wine, olive oil, brandy, wheat, flour, and hides from the foothills of the Andes (Mendoza, San José, Tucumán) to supply the growing city of Buenos Aires; 2) imports from Buenos Aires for consumption in the interior or for transit to Peru or Chile; and 3) goods moving along the Andean region of Argentina between Mendoza and Tucumán.⁵³ Apparently pack animals were also widely used, especially on the Buenos Aires-Potosí route,⁵⁴ but other conditions, such as the cheapness of oxen and grazing, undoubtedly made carting a competitive mode of transport.

The scale of the demand for Argentine carting is hard to establish, but it appears to have become significant only in the last three decades of the eighteenth century.⁵⁵ This was a period of considerable eco-

⁵⁰ Santos Martínez, *Mendoza*, 275; Concolorcorvo, *Itinéraire*, 73-74.

⁵¹ The carter guilds were well enough developed to be able to afford substantial legal fees, support permanent counsel, maintain prolonged litigation, and even send agents to the Court in Madrid. Santos Martínez, *Mendoza*, 226-227, 249, 270-271.

⁵² Many carters in Mendoza seasonally worked in agriculture. In Tucumán only a small part of the carters were anything like fully specialized. Concolorcorvo, *Itinéraire*, 79; Santos Martínez, *Mendoza*, 260, 282-283.

⁵³ María Rodríguez, "The Genesis of Economic Attitudes in the Río de la Plata," *HAHR*, XXXVI (1956), 171-172; José M. Mariluz Urquijo, *El Virreinato del Río de la Plata en la época del Marqués de Avilés, 1799-1801* (Buenos Aires, 1964), 129, 180-184; Martin de Moussy, *Description*, II, 496-497, 548; Giberti, *Ganadería Argentina*, 68-69; Santos Martínez, *Mendoza*, 94, 283, 309, 321; Concolorcorvo, *Itinéraire*, 65, 80. The Mendoza-Tucumán trade is somewhat conjectural, although there was a well-defined road, and on one occasion Mendoza brought timber for bridge building from Tucumán. See: Santos Martínez, *Mendoza*, 255-256, 275; Concolorcorvo, *Itinéraire*, 73-74.

⁵⁴ Concolorcorvo, *Itinéraire*, 90, 103; Santos Martínez, *Mendoza*, 276, 284, 321.

⁵⁵ See: Santos Martínez, *Mendoza*, 94; Ringrose, "Transport and Stagnation," Table 6; Aldo Ferrer, *The Argentine Economy* (Berkeley, 1967), 28.

conomic expansion in the region and rapid population growth in the province of Buenos Aires—from 19,200 in 1744 to 72,000 by 1797. The trend toward stock raising near the coast prevented the expansion of local produce farming around the city, since the landowners preferred to raise cattle for the export trades in hides and meat.⁵⁶ The volume of trade into the interior of Argentina and beyond into Peru and Chile expanded rapidly after 1778, as Charles III liberalized trade within the Spanish empire. To some extent this apparent increase probably represents trade shifting from illegal to legal channels, but surely there was a net increase.⁵⁷ Moreover, the trans-Argentine route from the Atlantic to Chile grew with Chilean demand and actually competed successfully with sea transport around Cape Horn until after the mid-nineteenth century.⁵⁸

The economic basis for the development of overland commerce was much less spectacular than the silver industry of Mexico. In part, to be sure, it was derived from the wealth of the Peruvian mines, which fed silver into Argentina in return for food, raw materials, and thousands of mules. For a long time, however, official regulations forced much of Peruvian commerce to follow the Panama route.⁵⁹ A less glamorous commodity of some importance was the yerba mate of Paraguay, which came down river to Buenos Aires and was then carted and packed overland throughout South America as a major item of intracontinental trade.⁶⁰

Undeniably, however, the really dynamic part of the developing Argentine economy was the cattle industry. Argentina began exporting cowhides as early as the first decades of the seventeenth century, and even before 1750 the trade sometimes reached consider-

⁵⁶ Ferrer, *Argentine Economy*, 29, 45, 54; Puiggrós, *Río de la Plata*, 59-60, 92, 95-96; Giberti, *Ganadería Argentina*, 68-69; Martin de Moussy, *Description*, II, 496.

⁵⁷ While the period 1772-1776 saw an average of five legal ship arrivals a year in Buenos Aires, 1792-1796 saw 395. From 1792 to 1799 the numbers of carts departing from Mendoza rose from 978 per year to 1,259, while the population of the Mendoza district rose from 7,478 in 1777 to 13,382 in 1802. Puiggrós, *Río de la Plata*, 52; Santos Martínez, *Mendoza*, 23, 284.

⁵⁸ Martin de Moussy, *Description*, II, 561-566.

⁵⁹ The efficacy of this regulation is hard to judge. On the one hand, Buenos Aires grew steadily in the 1700s; on the other, Lima was badly hurt by the lifting of regulation. The problem of enforcement is highlighted by the fact that per-unit transport costs from Lima to Potosí were 150 percent higher than from Buenos Aires to Potosí. Puiggrós, *Río de la Plata*, 38-39, 46-49; Ferrer, *Argentine Economy*, 41-44.

⁶⁰ Puiggrós, *Río de la Plata*, 44. The Buenos Aires-Mendoza-Chile route alone accounted for 500 cartloads of yerba mate per year. Santos Martínez, *Mendoza*, 283, 321.

able proportions. In the last half of the eighteenth century, with the expansion first of contraband and then of legalized trade, the industry achieved consistent growth—approximately 75,000 hides a year in 1700-1725 to nearly 1,500,000 a year in 1785-1800. This growth was accompanied by a parallel expansion of tallow and lard export. Toward the end of the century the government subsidized an attempt to create a meat salting industry as a complement to the tallow and hide trade, but with only moderate success. The export trade in hides, centered on Buenos Aires, was the heart of the economy, and its growth generated much of the demand for transport in the interior. As a basis for economic activity the cattle industry lacked the concentrated and spectacular wealth of the Mexican mines, but plentiful grazing, cheap animal power, and favorable terrain made possible a developed transport system with a much lower level of capital investment.

The carting enterprises of Spain, Mexico, and Argentina thus had the same cultural and technological origins, but developed three very different patterns. All retained some common characteristics, such as the use of the two-wheeled cart, with the same structure, harnessing techniques, and habits of seasonal travel. The carts of Mexico and Argentina were very similar, although in the sixteenth century the former was built with much more metal hardware. Both were much larger than their Spanish prototype, which continued to be used in central Spain. The latter had more primitive wheel mountings and only about one-fifth the carrying capacity of its Latin American counterparts. The Mexican carts were frequently pulled by mules,⁶¹ while those of Argentina and Castile were almost always used with oxen. In all three places the carts regularly traveled in convoys.⁶²

These differences were the results of distinctive economic contexts. In Castile, carting operated with a very low level of capital investment in a context of competing claims for grazing and rugged terrain which dictated use of small vehicles. The industry developed because of the central government, which subsidized the carters with grazing and legal protection and in crises absorbed some of the direct costs of

⁶¹ Apparently the more valuable cargoes traveling directly to and from the mines were pulled by mules. There is direct evidence, however, that oxen were also common carting animals. See: AGN, General de Parte, VI, 116, in Zavala, *Fuentes*, V, 9; Powell, "The 49'ers," 239; Dusenberry, *Mexican Mesta*, 87.

⁶² On the use of trains in Argentina, Santos Martínez, *Mendoza*, 275, 283; Concolorcorvo, *Itinéraire*, 77-78. For Mexico, see: Chevalier, *Land and Society*, 14; Mecham, *Francisco de Ibarra*, 99; Powell, "The 49'ers," 239. For Castile, see: Tudela, "Carreteros," 355-359; AHN, Consejos, legajos 211-3, 2868-25, 51197-50, 61.

transport. In Mexico, the physical obstacles to cart transport were sometimes great, but grazing and livestock were cheap. The obstacles were overcome by a plentiful supply of capital from the prosperous mining sector. This made possible construction of roads, use of relatively expensive mules and carts, and a relatively large scale of enterprise. The Argentine case combines characteristics of both the preceding examples. The land and animal power were very cheap, as in Mexico, but the scale of transport enterprise was smaller. The carts were large as in Mexico, but technically simpler, and they relied exclusively on oxen. The commerce of the Argentine covered comparable distances, but handled more mundane commodities. This trade was generated by Buenos Aires as the center of a growing export trade in cattle products, as a source for imports, and as a market for interior produce.

These situations suggest that land transportation was not necessarily as absolute a limitation on preindustrial economic growth as is sometimes suggested. In three very different situations specialized carting appeared and played an important role during periods of economic expansion. In agrarian, preindustrial societies, however, such episodes were inevitably limited by the structure and attitudes of society and by the limitations of technology, which created bottlenecks causing economic regression. This happened to some degree in all three of our examples, but in ways which suggest that the primitive means of transport were not always the immediate cause of stagnation.

The carting industry of Castile began to decline about 1800, contributing to the growing economic and political stagnation of the Spanish interior which marked the first half of the nineteenth century. The demand for specialized transport services steadily increased, for the population of Madrid grew by 25 percent in the last half of the eighteenth century, and the supply problem of the city was further aggravated by a rising rural population which retained more and more agrarian produce within its subsistence economy.⁶³ Also the years after 1793 saw Spain in a perennial state of full or partial mobilization for war. Further transport demands resulted from the requirements of a potentially promising import-export trade centered on Old Castile and the port of Santander and using a well-planned carting road through the coastal range.⁶⁴

But Spanish carting could not respond to these demands for the

⁶³ Antonio Domínguez Ortiz, *La sociedad española en el siglo XVIII* (Madrid, 1955), 55-76.

⁶⁴ Vicente Palacio Atard, *El comercio de Castilla y el puerto de Santander en el siglo XVIII* (Madrid, 1960).

fundamental reason that it was competing for the same limited resources as the expanding population and export industries. More carting meant increased grazing for daily and winter pasturage, but the population increase raised grain prices and encouraged landowners to turn grazing into arable, and the government to exploit wastelands.⁶⁵ The new import-export activities, moreover, were based on wheat, flour, wool, and leather goods, all of which necessitated land for grazing or farming. As a result, the grazing available to the carters tended to diminish, and the price of carting services apparently rose much faster than the general price level.⁶⁶

The only factor on which the carters could rely to counteract these trends was enforcement and expansion of the privileges granted by the crown. Its authority, however, declined under inferior leadership following the death of Charles III in 1788, and the revolutionary and Napoleonic wars distracted its attention. Aristocratic and local influences took advantage of this weakness to convert the carters' grazing to more profitable uses, borrowing "liberal" assumptions about the nature of proprietary rights in land.⁶⁷

By the mid-1790s, therefore, the carters had lost nearly half of the guaranteed winter pastures near Madrid.⁶⁸ In the years after 1800, they lost some of their tax exemptions, the right to graze on stubble lands, and their right to preemptive rental of private pastures.⁶⁹ The whole mechanism of protection was badly disrupted during the Napoleonic invasion, and the restoration of 1814 was far from successful. Violations of carting privileges, establishment of illegal tolls, and deterioration of roads were all widespread.⁷⁰ The situation worsened with the liberal revolution of 1820-1823, after which government protection became even more shadowy. During the 1820s grazing lands were enclosed rapidly with little regard for the carters' needs, and several of their other privileges were specifically revoked.⁷¹ Finally in 1836 the liberal regime of María Cristina abolished the

⁶⁵ Palacio Atard, *Comercio de Castilla*, 83-86; AHN, Consejos, legajo 2868-25; Klein, *The Mesta*, chapters on the eighteenth century.

⁶⁶ AHN, Consejos, legajo 1608-1; Ringrose, "Transport and Stagnation," Tables 4, 5, and 7.

⁶⁷ See: Marcia Dell Davidson, "Three Spanish Economists of the Enlightenment: Campomanes, Jovellanos, Flórez Estrada," (Ph.D. dissertation, Duke University, 1962).

⁶⁸ AHN, Consejos, legajo 1608-1.

⁶⁹ AHN, Consejos, legajos 2425-2, 2868-25; Santos Sánchez, *Colección de todas las pragmáticas, cédulas, provisiones, circulares, autos acordados, bandos y otras providencias publicadas en el actual reinado del señor Don Carlos IV* (4 vols., Madrid, 1794, 1797, 1801, 1805), IV, 335.

⁷⁰ AHN, Consejos, legajo 51197-8, 17, 31, 34, 40, 41, 42, 44, 51, 55, 56, 61.

⁷¹ AHN, Consejos, legajos 2868-25, 51197-35; Tudela, "Carreteros," 379.

protective bureaucracy of the carters. By 1840, they were reorganizing on a regional and private basis, but references to their activities imply that they were regarded as an anachronism.⁷²

Thus Castilian carting could not respond to the growing demands for specialized transport in nineteenth-century Spain. Even at the height of its development, in the 1780s, it had remained tied to the use of a primitive technology which carters could offset only in part by pooling vehicles and reducing labor costs. Unfortunately, the interior of Spain lacked any effective alternative form of transport, and the decline of carting helped to cut short such economic growth as had developed there during the eighteenth century.

The fate of the Mexican carting industry, which reached its developmental peak in the last decades of the sixteenth century, was quite different; yet some analogies can be drawn. If Castilian transport declined because the expanding economy and weakening political leadership choked off vital resources, Mexican carting declined because structural changes in the Mexican economy restricted the demand for specialized transport services. As has been suggested, the development of the Mexican economy, 1550-1600, was in large part geared to and supported by the silver industry. But at least three factors worked to distort and modify its development. Even while the mines were producing on a large scale, much of the external purchasing power which they generated for the Mexican economy was siphoned off by taxation for use in Europe. As a result, the exports of primary goods (silver) did not bring a corresponding inflow of European capital goods and manpower to maintain the economic growth which the mining industry had stimulated.

Perhaps even more basic was the growing shortage of labor in Mexico. From the time of the Conquest the huge Indian population declined steadily under the impact of European disease, forced labor exactions, and disruption of the native economic organization. After the great plagues of 1576-1579 there seems to have been a chronic shortage of labor in agriculture and industry. This shortage helped to encourage *latifundia* farming, which used the available labor more efficiently than the Indians' own farming arrangements. During the last decades of the century systems were developed for allocating the shrinking supplies of food and for rationing labor in order to sustain the vital parts of the economy, especially the cities and the silver mines.⁷³

⁷² AHN, Consejos, legajo 11867; Tudela, "Carreteros," 375.

⁷³ Woodrow W. Borah, *New Spain's Century of Depression* (Berkeley, 1951), 24, 27-33.

Paralleling this and in part a reaction to it, patterns of social organization and landholding increasingly hampered the growth and regional specialization first created by the mines. More and more the mining entrepreneurs and other persons in government and business looked on landholding and noble rank as signs of respectability. With a lack of moderation characteristic of many *nouveaux riches*, these people set about acquiring large holdings at the expense of the native farmers. The result was estates of unprecedented magnitude, which frequently had the resources for a balanced, self-contained local economy.⁷⁴

These potentially important developments were then reinforced by the decline of mining activity after 1600. By 1640 many mines had been shut down and output was but a fraction of the sixteenth-century peak.⁷⁵ The mining industry was suffering from many of the same disorders as the rest of the economy since 1580, particularly the rising costs of labor and supplies. Apparently the government's system of repartimientos had kept the mines fairly well supplied with labor until about 1600, but was increasingly unable to do so thereafter. Added to this were factors such as the fixed price for silver, rising taxes on mercury, a failure or inability to invest adequately in the mines themselves, and the subordination of entrepreneurial goals to those of aristocratic status and styles of living.⁷⁶ Under such pressures the mining industry began to decline—the last element of sixteenth-century prosperity to succumb to the growing depression.

As the mines closed, the industry and agriculture which had developed to supply them, lacking alternative markets, went into decline also. Among these collapsing enterprises were the carters. Presumably the sources of capital available to them were shut off, and they may have sought a more “respectable” style of living in a society where feudal-aristocratic values were strong. Moreover, the decline of mining impoverished the viceregal government in Mexico City, so that it was unable to pay the rising price of labor for roadwork. As a result, it abandoned the expensive carting roads which were vital to maintaining wheeled transport over long stretches of the interior and through the mountains to Veraacruz. In these circumstances, specialized cart transport came close to disappearing. Such

⁷⁴ Chevalier, *Land and Society*, 24-25, 48-49, 63-64, 151-152.

⁷⁵ *Ibid.*, 4, 39; John H. Elliott, *The Revolt of the Catalans, a Study in the Decline of Spain, 1598-1640* (Cambridge, 1963), 189. The latter points out that the crown's income from America fell from 2,000,000 ducats in 1600 to 800,000 in 1620, and that this was far from the low point.

⁷⁶ Chevalier, *Land and Society*, 180; Borah, *Depression*, 26-27, 43-44.

long-distance transport as continued usually involved compact valuable goods which could be carried on mules, often owned by Indian rather than Spanish muleteers. The huge Mexican *carro* continued to be used, but primarily within the self-contained great estates.⁷⁷

Interestingly, the revival of silver mining and the development of textile making and agriculture in the eighteenth century do not seem to have caused a reappearance of long-haul cart transport in Mexico. As late as 1803-1804 Alexander von Humboldt comments on the exclusive use of pack mules and upon the terrible condition of the roads.⁷⁸ The route from Veracruz to Mexico City, in fact, had degenerated into a perilous mule track, and construction of a new wagon road had only just begun. The Acapulco road apparently was never open to carts for its whole length, and by the end of the eighteenth century the only important route which remained open to wheeled traffic ran up the plateau from Mexico City to Zacatecas, Durango, and Chihuahua. Accounts from that period, moreover, emphasize the prevalence of pack mule transport along that route.⁷⁹ As late as the 1850s traders might refer to large freight carts and even to a diligence service, but they continued to comment on the prevalence of pack mules in transport.⁸⁰ Why did the economic revival fail to regenerate the long-distance cart transport present in the frontier economy of the sixteenth century? The reasons are far from clear, especially since there is evidence of large-scale pack mule transportation. Perhaps there was a pragmatic conservatism amongst the class which provided transporters, an attitude analogous to that which Clement Motten has observed among the mine workers.⁸¹ Bad roads alone were enough to justify using pack mules. But the condition of the roads in turn suggests a lack of capital investment in a time of prosperity, and this also needs explanation. In fact, the whole matter of transport in eighteenth-century Mexico needs further work.

⁷⁷ Chevalier, *Land and Society*, 290.

⁷⁸ Alexander von Humboldt, *Ensayo político sobre el reino de la Nueva España* (6th ed., 4 vols., México, 1941), III, 140, IV, 31-32, 37.

⁷⁹ Humberto Vásquez-Machicado, "Los caminos de Santa Cruz de la Sierra en el siglo XVI," *Revista de Historia de América*, No. 40 (México, 1955), 499; R. L. Duffus, *The Santa Fe Trail* (New York, 1930), 52-53; W. W. H. Davis, *El Gringo; or, New Mexico and Her People* (New York, 1857), 207-208; Max L. Moorhead, "The Private Contract System of Presidio Supply in New Spain," *HAHR*, XLI (1961), 38; Humboldt, *Ensayo*, IV, 32; Dusenberry, *Mexican Mesta*, 183.

⁸⁰ David M. Pletcher, "A Prospecting Expedition Across Central Mexico in 1856-67," *Pacific Historical Review*, XXI (1952), 24-27; Gilliam, *Travels*, 74.

⁸¹ Clement G. Motten, *Mexican Silver and the Enlightenment* (Philadelphia, 1950), Chapters II and V.

The fate of the Argentine carting industry follows yet a third pattern—one in which some of the original demands for carting services declined, but were replaced by others. In effect, the Argentine interior underwent economic changes similar in scope to those of Mexico during an earlier period, but for different reasons and with different results.

Argentine carting had come into existence to supply the city of Buenos Aires with produce from the interior provinces and to service the largely illicit commerce from the Atlantic into Peru and Chile. This commerce operated within a framework of imperial protection created by the Spanish government and maintained even after the limitations on trade within the empire were removed in 1778. This reform started the decline of some local industry, but the overall system of protection, while far from perfectly implemented, allowed handicraft manufactures and foodstuffs from the distant interior to compete with some success in the markets of Buenos Aires until after 1800.⁸²

With the Napoleonic occupation of Spain and the breakup of the empire, the merchants of Buenos Aires seized the power to shape commercial policies in the Río de la Plata area. As a result, that city obtained a near monopoly over trade into the interior and at the same time did away with protection for Argentine products in order to increase its import-export business.⁸³ These changes crippled the economy of the interior, for its handicraft textiles could not compete with machine-made goods from England, nor its agricultural goods with the now unlimited produce entering from Brazil. Internal manufacturing contracted to purely local significance, as in seventeenth-century Mexico, and was then destroyed altogether. European goods, brought by ship and then carried inland by the Argentine carting industry, undercut local goods even at the places of production.⁸⁴

This last fact helps explain why the Argentine carting industry did not decline as did that of Mexico. The carters could shift from an agency of internal exchanges to an extension of the world trade pattern, bringing goods directly into the interior of the country. At the same time, the transit trade to Chile remained active, for as late as the 1850s it was still cheaper to cart goods across the Argentine

⁸² Giberti, *Ganadería Argentina*, 40, 75-76.

⁸³ Puiggrós, *Río de la Plata*, 99.

⁸⁴ By the middle of the nineteenth century, in fact, 50 percent of the imports by sea into Buenos Aires consisted of goods which competed directly with products of the interior. Santos Martínez, *Mendoza*, 123; Giberti, *Ganadería Argentina*, 77-78; Ferrer, *Argentine Economy*, 67.

and pack them over the Andes than to make the long and dangerous sea trip around Cape Horn.⁸⁵ Above all, while the interior economy regressed, the country did not lose its major source of wealth and capital, the export trade in cattle products. Thus well into the nineteenth century this primitive form of transport remained competitive in some situations. Its ability to do so, in contrast to Spanish carting at the same time, was undoubtedly due to the plentiful resources of a relatively open frontier society.

These three developments demonstrate the adaptability of essentially medieval transportation technology, given favorable conditions. Such adaptability kept the technology competitive in some cases well into the era of the industrial revolution. Given sufficient capital, such primitive technology could indeed support considerable economic growth. At a more general level these examples illustrate, in a pre-industrial setting, the difficulties of achieving economic growth in old societies with complex social, economic, and cultural institutions.

To compare settled and frontier areas on the basis of three examples and a limited number of sources is a debatable enterprise. Yet the examples used have an important common denominator in their culture and technology, thus making it relatively easy to see the impact of different contexts. It would be instructive to measure the growth of these economies based on land transport in comparison with those benefiting from the assumed advantages of water transport but otherwise similar. Land transport could and did support economic growth under certain circumstances where no other option was available. Therefore, its interactions with other economic factors must be examined carefully wherever it appears. The limitations of animal-powered land transport could and did stifle economic growth, as in Castile. Yet it did not directly contribute to the depression of seventeenth-century Mexico, and in Argentina it continued to meet the demands which developed until replaced by the distinctly superior technology of the railroad. If nothing else, this article suggests that it is risky to accept blindly the truism that water transport was always essential to economic growth in preindustrial societies.

⁸⁵ Martin de Moussy, *Description*, II, 548, 560-565.