

Camel Caravans as a Mode of Production in Postclassical Afro-Eurasia. An Interview with Richard W. Bulliet

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Abstract. Objective/Context: This interview discusses the expansion of the camel caravan trade between roughly the sixth and sixteenth centuries. Wheeled transportation—used in West Asia during the Roman and Sasanid periods—basically disappeared around 500 CE, when camel caravans took over the transport business. Since the domestication of camels in Southern Arabia, sometime between 4000 and 3000 BCE, and its adaptation over centuries to carrying loads in the sparsely vegetated desert, the network of camel caravan activity gradually extended way beyond its original center. The caravan system increasingly expanded into many areas of West and Central Asia, North Africa, North India, North-West China, and, to some extent, even parts of “Islamicate” Europe (Andalusia and Sicily). Indeed, camel caravans became the most extensive network of overland transportation the world had seen before the rise of railroad transportation. **Originality:** In this interview, Richard W. Bulliet discusses how camel caravans replaced wheeled transport in the “Middle East” and how the caravan system restructured many facets of socio-economic and political life in the Arid Zone between approximately 500 and 1500 CE. **Conclusion:** The depth of this restructuring, he argues, can be compared to changes in the mode of production commonly observed by economic historians elsewhere, including those associated with the rise of mercantile capitalism.

Keywords: camel caravan trade, mercantile capitalism, “Middle East”, mode of production, transportation.

Las caravanas de camellos como modo de producción en la Afro-Eurasia posclásica. Una entrevista con Richard W. Bulliet

Resumen. Objetivo/Contexto: Esta entrevista aborda la expansión de las caravanas comerciales de camellos entre los siglos VI y XVI aproximadamente. El transporte sobre ruedas —utilizado en Asia Occidental durante los periodos romano y sasánida— desapareció prácticamente hacia el año 500 de Nuestra Era, cuando las caravanas de camellos se hicieron cargo del negocio del transporte. Desde la domesticación de los camellos en el sur de Arabia, en algún momento entre los años 4000 y el 3000 a.C., y su adaptación durante siglos al transporte de cargas en el desierto de escasa vegetación, la red de actividad de las caravanas de camellos se extendió gradualmente mucho más allá de su centro original. El sistema de caravanas se extendió cada vez más por muchas zonas de Asia occidental y central, el norte de África, el norte de la India, el noroeste de China y, en cierta medida, incluso en partes de la Europa islámica (Andalucía y Sicilia). De hecho, las caravanas de camellos se convirtieron en la red de transporte terrestre más extensa del mundo antes de la aparición del ferrocarril. **Originalidad:** En esta entrevista, Richard W. Bulliet analiza cómo las caravanas de camellos sustituyeron al transporte sobre ruedas en el “Medio Oriente” y cómo el sistema de caravanas reestructuró muchas facetas de la vida socioeconómica y política en la Zona Árida entre los años 500 y 1500 d.C. aproxi-

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madamente. **Conclusiones:** La profundidad de esta reestructuración, argumenta Bulliet, puede compararse con los cambios en el modo de producción comúnmente observados por los historiadores de la economía en otros lugares, incluidos los asociados con el surgimiento del capitalismo mercantil.

Palabras clave: capitalismo mercantil, comercio de caravanas de camellos, modo de producción, “Oriente Medio”, transporte.

Caravanas de camelos como modo de produção na Afroeurásia pós-clássica. Uma entrevista com Richard W. Bulliet

Resumo. Objetivo/contexto: esta entrevista aborda a expansão do comércio de caravanas de camelos aproximadamente entre os séculos 6 e 16. o transporte sobre rodas — praticada na Ásia Ocidental durante os períodos romano e sassânida — basicamente desapareceu por volta de 500 da nossa era, quando as caravanas de camelos assumiram o controle do negócio de transporte. Desde a domesticação dos camelos no sul da Arábia, em algum momento entre 4000 e 3000 a.C., e sua adaptação ao longo dos séculos para transportar cargas no deserto de vegetação esparsa, a rede de atividade das caravanas de camelos se estendeu gradualmente para muito além de seu centro original. O sistema de caravanas expandiu-se cada vez mais para muitas áreas da Ásia Ocidental e Central, norte da África, norte da Índia, noroeste da China e, até certo ponto, até mesmo para partes da Europa islâmica (Andaluzia e Sicília). De fato, as caravanas de camelos se tornaram a mais extensa rede de transporte terrestre que o mundo já havia visto antes do surgimento do transporte ferroviário. **Originalidade:** nesta entrevista, Richard W. Bulliet analisa como as caravanas de camelos substituíram o transporte sobre rodas no “Oriente Médio” e como o sistema de caravanas reestruturou muitas facetas da vida socioeconômica e política na Zona Árida entre aproximadamente 500 e 1500 da nossa era. **Conclusão:** segundo Bulliet, a profundidade dessa reestruturação pode ser comparada a mudanças no modo de produção comumente observadas por historiadores econômicos de outros lugares, incluindo aquelas associadas ao surgimento do capitalismo mercantil.

Palavras-chave: capitalismo mercantil, comércio de caravanas de camelos, modo de produção, “Oriente Médio”, transporte.

Ever since his well-known and controversial book *The Camel and the Wheel* (1975), Richard W. Bulliet has continuously deepened our knowledge of the Afro-Eurasian “camel caravan trade” prior to the sixteenth century. In the following interview, Professor Bulliet argues that the “caravan system” could be characterized as both a mode of production and a mode of transportation, bearing some resemblances to forms of European merchant capitalism in the late medieval period. However, while European merchant capitalisms structured and hinged on seaborne commerce well into modern times, the camel caravan trade shaped long-distance overland transportation in many parts of mainland Asia and northern Africa across the Sahara Desert between ca. 500 and 1500 CE. As Richard W. Bulliet contends, a maritime merchant did not have much control over “how the goods got to the point of export and how they were distributed at the other end of the voyage [...]. In the case of camel caravans, long-distance transport was not necessarily separate from more localized transport nexuses,”¹ and traders had to negotiate with the various jurisdictions through which they intended to pass. In the case of camel caravans, independent merchants regulated many aspects of mercantile activity “in Mesopotamia and the Eastern Mediterranean, on

1 Richard W. Bulliet, “The political Economy of the Arid Zone: Camel Caravans as a Mode of Production,” *Damqatum: the CEHAO newsletter*, n.º 15 (2019): 10. Online: <https://uca.edu.ar/es/facultad-de-ciencias-sociales/departamentos/departamento-de-historia/publicaciones/damqatum>

the ‘Silk Road,’ and the great East-West trade route through the Indian Ocean.”² Given the post-classical transport network that connected Asia, Africa, and Europe, Richard W. Bulliet offers an innovative transregional historical perspective that revolves around human–animal interaction. Furthermore, by showing how the camel caravan trade enabled the rise of merchant capital in parts of Asia and Africa in the second millennium CE, he challenges Eurocentric origin stories and maritime-centered views about the emergence of merchant capitalism and, thus, opens up new avenues of inquiry for future research.

Richard W. Bulliet is emeritus professor at the History Department of Columbia University. He specializes in the history of the so-called Middle East, the social and institutional history of the Islamic world, the history of technology, and the role of domestic animals in history. He lectures on topics such as Islamo-Christian civilization, the history of Islamic societies, North Africa, and Iran, as well as the history of technology. Bulliet has written many scholarly works, including *The Camel and the Wheel* (Cambridge: Harvard University Press, 1990 [1975]); *Islam: The View from the Edge* (New York: Columbia University Press, 1994); *Hunters, Herders, and Hamburgers* (New York: Columbia University Press, 2007); *Cotton, Climate, and Camels in Early Islamic Iran: A Moment in History* (New York: Columbia University Press, 2011), and *The Earth and Its Peoples: A Global History, Vol. 1: To 1550* (Stamford: Cengage Learning, 2014). After his retirement, the Richard W. Bulliet Chair in Islamic History has been established in his honor at Columbia University.

1. *Let us begin the conversation by talking about a topic that you have extensively studied and covered in your previous work: the role of transportation in history. Transportation plays a fundamental role in full-fledged capitalist economies. Despite its centrality, studies on the relationship between the rise of capitalism and evolving transportation systems are still relatively scarce. Could you kindly touch upon this relationship and explain why transportation has had a rather marginal role in the study of pre-industrial and early industrial capitalism?*

In 1884, two years after founding the *Customer’s Afternoon Letter*—which would turn into *The Wall Street Journal* in 1899—Charles Dow and Edward Jones proposed the idea of an index that would reflect the overall activities of the stock market. The stocks contributing to the original Dow average included nine railroads and two industrial manufacturers. They soon decided, however, to separate industrial from transportation issues, and in 1896, the Dow Jones Industrial Average became a daily report.

The initial primacy of railroad companies in the Dow average reflects the massive investment of capital that created a national rail network in the second half of the nineteenth century. Yet economic theorists from Adam Smith to Karl Marx had focused their analysis on the production of industrial goods and said comparatively little about transportation. This was because Smith’s *An Inquiry into the Wealth of Nations* was published in 1776, seven years before the first successful demonstration of

2 Jürgen Kocka, *Capitalism. A Short History* (Princeton: Princeton University Press, 2016), 25.

a steamboat, and Marx's call upon the workers of the world to unite in his *Communist Manifesto* of 1848 came at a time when railroad lines longer than 150 miles were still rare.

In short, the mainstream of nineteenth-century economic theorizing dealt with the decline of craft production and the rise of factories in the Industrial Revolution but largely ignored the revolutionary changes in transportation—first steamboats and railroads, then trucks and automobiles (but also the rickshaw in East and South Asia after 1869)—that affected every aspect of life, including organization of labor, by the century's end. As the separation of the Dow Jones Index into transportation and industrial averages indicates, the differences between manufacturing widgets and transporting coal and passengers were too substantial for inclusion in a single category. The industrial index has overshadowed the transportation index up to the present day. Nevertheless, many corporations now included in its calculation, like Amazon, American Express, and JPMorgan Chase, have a higher economic stake in delivering services and managing money than in producing goods. The Dow Transportation Index companies, however, still deal in transport.

2. *You argue that many of the existing analyses of modes of production are rather Eurocentric and hinder a better understanding of economic transitions as, for example, in the case of Afro-Eurasian economies. You further explore the interconnections between transportation and production by proposing that the “mode of transport” should be regarded as a major analytical category alongside, but not subordinated to, the “mode of production.” Could you please elaborate on this idea?*

The phrase “mode of production” popularized by Marx's followers rests on the premise that the changing relations between property, raw materials, capital, and labor that marked the transition from feudal to capitalist society were primarily based on the specific characteristics of manufacturing products. Marx and Engels' evolutionary schema of modes of production going from primitive communism, through slavery, feudalism, and primitive accumulation, to capitalism, with communism envisioned as a future utopia, is well known. Though focused mainly on Europe, the Marxist theory also included a hypothetical “Asiatic mode of production,” which served as a catch-all for economic structures outside Europe.

A different way of structuring Afro-Eurasian economic history would be to look at modes of transport rather than modes of production or to place the former in the same framework as the latter. Within the worldwide evolution of modes of transport as modes of production, which I will not summarize here, the early Islamic societies of the Arid Zone were distinctively shaped by their utilization of camel caravans for overland transport.

3. Most histories dealing with the arrival of Europeans in North and South America highlight the introduction of horses and the important contribution these and donkeys made to enable subsequent historical developments. By contrast, as you have argued in your book *The Camel and the Wheel*, existing historical studies on West Asia and North Africa make almost no mention of the geographic spread of one-humped camel herding. Using literary works, letters, and memoirs, among other sources, you analyze the expansion of camel herding within and outside its places of origin. Could you tell us more about this revolutionary process?

Between 300 BCE and 1300 CE, the extent of camel herding from east to west increased from roughly 1,300 miles to 6,000 miles (see Map 1). Inasmuch as camel herding was an essential precursor of camel caravan transport, its geographic expansion had an economic impact nothing short of revolutionary. It not only transformed the trading economy and made nomadism an integral part of it, but it also affected so many aspects of human interaction that it may justifiably be considered a mode of production in addition to a mode of transportation.

In form, the following maps and comments, mainly based on my book *The Camel and the Wheel* (1975), encapsulate the geographic expansion of camel herding.

Map 1. Approximate extent of camel herding in 300 BCE



Source: Digital map elaborated by Christian Medina, based on drawings provided by Richard W. Bulliet.

- One-humped camels are native to the Arabian Peninsula, with organized herding apparently commencing in the south in the fourth millennium BCE. Camel herding extended northwards

into the Syrian, Iraqi, and Jordanian desert fringes by roughly 1600 BCE; nevertheless, camel-breeding Arabs were treated as impoverished and uncontrollable desert barbarians.

- Caravan trading to the benefit of nomadic Arabs rather than urbanized merchants became significant ca. 300 BCE, providing the caravan city of Petra in Jordan with its great wealth.
- Camels herded by Arabs are mentioned on routes in Upper Egypt connecting the Nile and the Red Sea coast [Hélène Cuvigny, “L'élevage des chameaux sur la route d'Edfou à Bérénice d'après une lettre trouvée à Bi'r Samut (iii^e siècle av. J.-C.)”].
- Camels in Somalia came from southern Arabia at some very early point. Down to modern times, they are neither ridden nor used for commercial caravans. They carry camp goods.
- The Somali breeding season is April-May, coinciding with the monsoon. Camels in more northerly lands with winter rainfall, e.g., Upper Egypt, breed from November to February. Winter rains prevail in almost all of Arabia, the camel homeland. The spring monsoon only affects the Yemeni highlands. In addition to geographical proximity, this suggests that camels in Somalia originally came from Yemen (see Map 2).

Map 2. Approximate extent of camel herding in 300 CE



Source: Digital map elaborated by Christian Medina, based on drawings provided by Richard W. Bulliet.

- Camel caravan trading flourished at Palmyra in Syria, which became a significant political power in the 260s. The caravan god Dusares belonged to the Palmyrene pantheon.

- I am assuming, without specific evidence, that Somali camel use gradually expanded into Eritrea and northeast Kenya, where camels are found today.
- Latin writers describing Roman North Africa make almost no reference to camels in the first few centuries of the Common Era, which indicates that they were not native fauna. Then in 363, Ammianus Marcellinus wrote that 4,000 camels were requisitioned from Lepcis Magna in Tripolitania (northwest Libya). The spread of large-scale herding from the “Middle East” must have occurred before then. Bas-reliefs from the period confirm the widespread use of camels in Tripolitania and Tunisia to pull plows and carts. Roman imperial era camel figurines sometimes show animals loaded with pottery amphorae fitted into wooden frameworks, presumably carrying wine.

4. Before you continue describing the process of expansion of camel herding westward, we would like to take the opportunity to allude to the thesis of your book, as it may help to clarify an otherwise complex process. In *The Camel and the Wheel*, you describe the process as follows: “In schematic summary, the North Arabian saddle made possible new weaponry, which made possible a shift in the balance of military power in the desert, which made possible the seizure of control of the caravan trade by the camel breeders, which made possible the social and economic integration of camel-breeding tribes into settled Middle Eastern society, which made possible the replacement of the wheel by the pack animal.”³ Now, what were the different stages and phases of the camel caravan system? In other words, would it be possible to periodize the “camel caravan mode of production” and provide us with a rough timeline?

Let me answer your question, again, in a summary form:

3 Richard W. Bulliet, *The Camel and the Wheel* (New York: Columbia University Press, 1990 [1975], 110. See also Richard W. Bulliet, “Le Chameau et la Roue au Moyen-Orient,” *Annales: Économies, Sociétés, Civilisations* 24, n.º 5 (1969): 1092-1103; “Why They Lost the Wheel,” *Aramco World* xxiv (1973): 22-25; “Sedentarization of Nomads in the Seventh Century: The Arabs in Basra and Kufa,” in *When Nomads Settle*, edited by Philip Salzman (New York: Bergin, 1980), 35-47; “Botr et Baranès: hypothèses sur l’histoire des Berbères,” *Annales: Économies, Sociétés, Civilisations* 36, n.º 1 (1981): 104-116; “How the Camel Got its Saddle,” *Natural History* xcii, n.º 7 (1983): 52-59; “Determinism and Pre-Industrial Technology,” in *Does Technology Drive History? The Dilemma of Technological Determinism*, edited by Merritt Roe Smith and Leo Marx (Cambridge: MIT Press, 1994), 201-215; “Economic Systems and Technologies” and “Communication and Transport,” in *History of Humanity: Scientific and Cultural Development*, Vol. iv: *From the Seventh to the Sixteenth Century*, edited by M. A. Al-Bakhit, L. Bazin, and S.M. Cissoko (Paris: UNESCO, 2000), 71-83, 84-95; “Communication, Transportation, and Exploration,” in *World Eras, Vol. 2: Rise and Spread of Islam 622-1500*, edited by Susan L. Douglass (Detroit: Gale, 2002), 138-160; *Cotton, Climate, and Camels in Early Islamic Iran: A Moment in World History* (New York: Columbia University Press, 2009); “The Camel and the Watermill,” *International Journal of Middle East Studies* 42, n.º 4 (2010): 666-668, <https://doi.org/10.1017/S0020743810000899>; “History and Animal Energy in the Arid Zone,” in *Water on Sand: Environmental Histories of the Middle East and North Africa*, edited by Alan Mikhail (New York: Oxford University Press, 2012), 51-69; “Afterword: Camels and Deserts,” in *Camels in Asia and North Africa. Interdisciplinary Perspectives on their Significance in Past and Present*, edited by Eva-Maria Knoll and Pamela Burger (Vienna: Austrian Academy of Sciences Press, 2012), 231-36; *The Wheel: Inventions and Reinventions* (New York: Columbia University Press, 2016); “Why Nishapur?,” in *Cities of Medieval Iran*, edited by David Durand-Guédy, Roy P. Mottahedeh, Jürgen Paul (Leiden: Brill, 2020), 100-123.

- Camel herding disseminated westward at an unknown pace across the southern Sahara Desert and the African Sahel to its south. Riding saddle designs positioning the rider in front of the hump are used throughout the area today and are depicted in Saharan rock art. These designs differ markedly from those in use in Arabia, though at least one Yemeni bas-relief of this period shows a possible model. These saddles cannot be used for baggage. Camels may have disseminated southward along the Nile from northern Egypt, but Yemen seems like a more probable point of origin. Like Somali camels, southern Saharan camels breed in the spring. There is no connection between Roman camel use north of the Sahara and the camel cultures of the southern desert.
- Evidence of Arab merchants being active in Sasanid Iran and the presence of a one-humped camel on a Sasanid-era wall painting in Uzbekistan (Penjikent) suggest that a few one-humped camels were in use commercially on the western reaches of the Silk Road in Transoxiana, but nomadic camel herding seems not to have reached Iran under the Sasanids (see Map 3). Most Silk Road animals were still two-humped Bactrians from Central Asia, though a Chinese source referring to northern Afghanistan references one-humped camels in first century CE.

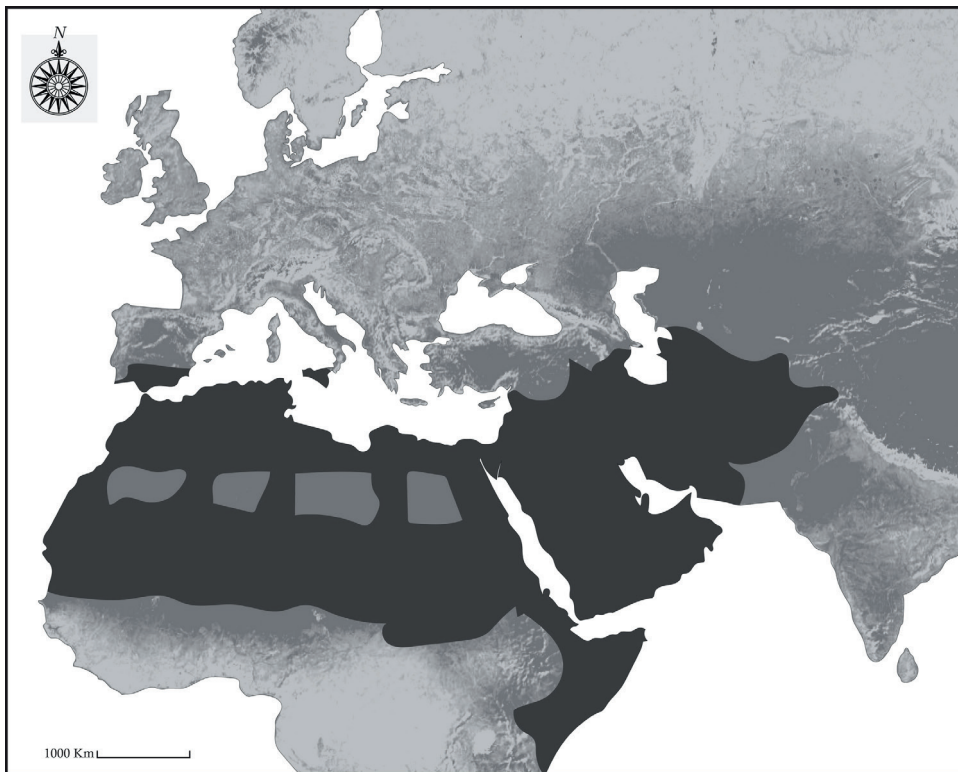
Map 3. Approximate extent of camel herding in 700 CE



Source: Digital map elaborated by Christian Medina, based on drawings provided by Richard W. Bulliet.

- Amphorae, presumably containing wine, no longer appeared in camel depictions. This presumably reflects a Muslim ban on drinking wine and an effort to suppress the most important trading commodity in Late Antiquity.
- There was no significant trade across the Sahara Desert.
- Southern Saharan camel saddle designs, breeding schedules, and physical traits, such as pure white and piebald coloration, were unknown in the north.
- I assume a continuing expansion of camel herding in Egypt and Sudan.
- Arab armies garrisoned in Turkmenistan (Marv) and northern Afghanistan (Balkh) introduced one-humped camel-herding to the eastern frontiers of the Islamic caliphate. The western part of the Silk Road shifted from two-humped Bactrian camels to one-humped camels and *bukhts*, extremely strong hybrid crosses between one-humped females and two-humped males. The hybrid industry centered on Marv and Balkh.
- Turkmenistan gradually shifted from two-humped to one-humped livestock, possibly with the ethnic change of nomad breeders. There is little evidence of camel nomads in southern Iran or Afghanistan south of the Hindu Kush (see Map 4).

Map 4. Approximate extent of camel herding in 1000 CE



Source: Digital map elaborated by Christian Medina, based on drawings provided by Richard W. Bulliet.

- Trade across the Sahara Desert followed several tracks departing from northern oases in Morocco, Algeria, Tunisia, and Libya.

- New migrants from Arabia (Bani Hilal, Bani Sulaim) increased the population of camel nomads in Upper Egypt and then, after 1013, vigorously expanded into North Africa along the Mediterranean coast.
- Camel nomadism was established throughout Iran and Afghanistan. In southern Iran, nomadic life may have begun with Brahui speakers, but Baluchis spreading into the region from the west established themselves all the way to Pakistan at a time that has not been pinned down.
- Turkmenistan, the most northerly regional extension of one-humped camel breeding, developed a cold-resistant variety with long hair that became identified with Turkic nomads who moved into northern Iran and Anatolia in the eleventh century (see Map 5).

Map 5. Approximate extent of camel herding in 1300 CE



Source: Digital map elaborated by Christian Medina, based on drawings provided by Richard W. Bulliet.

- Northern Africa, from the Mediterranean to the Sahel region south of the Sahara Desert, became a camel country, with camel use extending somewhat into southern Spain and Sicily.
- Caravan trading, mostly using long-haired one-humped animals and *bukht* hybrids, transformed the transportation economy of Anatolia.
- Armies with camel logistical trains moved into Pakistan and northern India with invaders who established polities in various regions. Camel nomadism followed this development.

- Mongol khanates brought cold-adapted camels to Crimea and the Volga valley.
- The camel caravan economy reached its maximum geographical extent.
- Subsequently, colonizing Europeans tried to introduce, unsuccessfully, camels into other parts of the world, including Cuba, Brazil, Java, British Columbia, and the United States. They met success only in the Canary Islands and Australia.

5. *Thank you for the detailed geographical analysis of camel herding expansion. Now, allow us to turn from geography to economics. As you made clear in a number of previous works, the foundation of “the camel caravan trade as a mode of transportation/mode of production” was the lowering of the cost of energy through the use of a superior pack animal. Could you please further develop this point?*⁴

The trip overland from Baghdad to Nishapur, the two largest Muslim cities in the year 900, covers about a thousand miles. Considering the need to cross the Zagros Mountains in western Iran, a camel or donkey caravaneer, like a man with a full backpack, planned on averaging about 20 miles per day. This made it a 50-day trip. Wheeled transport did not exist in the region after about the fifth century CE, nor was water transport a possibility for any part of the journey.

Let me compare the situations of a human porter carrying a pack that weighs 60 pounds, a donkey bearing a burden of 120 pounds, and a camel with a 350-pound load. (Mules existed but were not as widely used as camels and donkeys.) What is the cost per journey of each of these three modes of conveyance if you are a merchant seeking to transport a ton (2,000 pounds) of commercial cargo from one city to the other, and circumstances prevent you from dividing the trip into a dozen or so short segments for each of which you employ different workers and transport animals?

If a porter's 60-pound backpack is entirely filled with commercial goods, you will need 33 men. However, since these men have to eat and drink, some part of their load must consist of provisions. Estimating the food needs of a laborer at two-and-a-half pounds of bread (or equivalent) per day—a figure sometimes used by historians of medieval Europe—and throwing in a water skin, you would need additional two backpacks of provisions for each man for a 50-day period. Since this would mean hiring two additional porters carrying nothing but supplies for each cargo carrier, it is not a practical option.

Insofar as you would have to rely on buying provisions on the road, the provisioning problem would balloon your budget. You could, of course, carry some goods to be traded for food and water *en route*, but this would diminish the space for commercial cargo and, thereby, you would necessitate more porters to reach your goal of a one-ton total payload.

Let us say that you have enough cash to buy provisions as you go, or you have established credit arrangements with provisioners at different stopping points along the way. And let us further say that the cost of food and water for each porter is one dollar per day. This makes the minimum provisioning cost for your 33 porters \$1,667 dollars (33 men for 50 days @ 1 dollar a day). However, unless your porters are slaves or soldiers or otherwise compelled to work for minimal or zero

4 The following responses are partly based on Bulliet's text titled "The political Economy of the Arid Zone," published on his academia page in 2018 and Damqatum (n.º 15) in 2019 respectively.

pay, you will also need to compensate each of them for almost two months of toil. If that compensation equals, say, a quarter of a day's sustenance, then your total investment in transport provisions is \$2,084.

Given these assumptions, a ton of the commodity you wish to transport must be worth at least that much at its final point of sale. And to that, you have to add the cargo's cost at its point of origin before you can even begin to think about turning a profit. So the question is: What kind of goods are likely to be worth, per ton, as much as the maintenance of 33 porters for 50 days in addition to their purchase price at the point of origin, not to mention the additional amount you would need to earn enough net profit to make the trek seem worthwhile?

Foodstuffs can probably be ruled out unless they are rare and very light in weight, like saffron and other exotic spices. Likewise, heavy objects like metallic ores can be ruled out since the percentage of salable metal left after smelting would be a very small portion of their gross weight. On the other hand, gemstones and pearls are light, durable, and high in value if they happen to be plentiful at the point of origin but rare in the terminal market. The same might hold for incense resins. Yet shipments of goods like these could only be marketed to very wealthy consumers, and a one-ton influx of such a luxury would almost certainly crash the market for that commodity at the end of the road.

Consequently, as long as human porters are seen as the primary participants in very long-distance trade, a handful of trekkers carrying a few pounds or less of precious goods in backpacks filled mostly with provisions for the road makes more sense than large shipments by a long line of porters. Such solitary trekkers would be vulnerable to robbers, of course, but they would probably gather to travel as a group or front the cost of hiring protection and/or paying off potential bandits.

The upshot of these considerations is that prior to the appearance of domestic beasts of burden, or in world regions that never acquired any animal portage, like most of the pre-Columbian Americas and equatorial Africa, long-distance overland trade unsubsidized by governmental or military provisioning networks must always have been fairly uncommon and devoted to small quantities of precious goods. Larger cargoes made up of goods of modest value had to travel by water, thus turning certain sea, lake, and river ports into thriving entrepôts. Nevertheless, seaborne commerce ran substantial risks of shipwreck and piracy, and traders along rivers faced occasional rapids and waterfalls and had a much harder time going upstream than downstream.

6. What happened next with the appearance and domestication of beasts of burden?

The first beast of burden to become available for labor exploitation was the ox. Evidence of early employment of cattle for carrying loads on their backs (*boeufs porteurs*) can be found in Saharan rock art, usually dated to the period before the climatic change that caused the verdant Saharan grasslands of deep antiquity to start to dry up, beginning around 5000 BCE. Bovine animals were also used to carry loads in pre-modern India, Laos, and Tibet. Once carts and wagons became available, no earlier than 3500 BCE, oxen (called bullocks in India) commonly pulled them in many areas. However, terrain difficulties called for the retention of pack bullocks in India in situations that allowed the animals to graze as they went along.

With respect to the "Middle East," references to or images of bovines carrying loads on their backs are rare. Possibly, this happened because oxen were too valuable for plowing to be freed up

for trips of more than a few miles or, perhaps, the lack of grazing during overland treks through arid territory unsuited them for caravan work. Whatever the case with cattle, domestic donkeys became available in northeast Africa between 4000 and 3000 BCE and gradually became the region's preferred beast of burden over a much wider area. Originally a desert animal, the Nubian wild ass from which all domestic donkeys evolved was well adapted to the constrained provisioning circumstances involved in the Arid Zone overland trading.

So why is relatively little heard about donkeys employed for long-distance trade, as opposed to references to the many used by villagers for shorter hauls and the few depicted as tag-along of camel caravans? The most important fact is that a typical donkey load is 120 pounds, which only doubles what a human porter can carry. Moreover, for every three or four donkeys, there must be a donkey driver. So, our hypothesized ton of commercial cargo would require 16 donkeys, which would need to be bought or rented, along with four drivers. Regarding provisioning, beyond the needs of the drivers, the donkeys would require fodder daily, which would have to be carried or bought on the road. Donkeys on caravans would have to be corralled or tied up at night. So, grazing them after dark, as done commonly with camels, which can be hobbled by strapping a front leg in a folded position, cannot be relied on. This means that if, say, four additional animals were needed to carry provisions for the drivers and their beasts, you would also need one more driver. As to the gains realized by substituting human porters with donkeys for long-distance hauling, it is hard to imagine a donkey caravan being more than twice as efficient as a string of human porters. And it is doubtful that a gain in the capacity of this scale would have greatly broadened the mix of goods that could be carried economically. Perhaps bags of dried fruits and nuts rather than just rare spices, and perhaps durable crafted goods rather than just pearls and gemstones, but really large loads of valuable but bulky goods, like furs, leather, and textiles? Probably not.

Mules are stronger and larger than donkeys and better suited to pick their way along mountainous tracks. However, as sterile hybrids, mules have to be specially bred, which amounts to an opportunity cost that might have been undesirable, particularly given the major role horses played in military affairs. After all, every mule born to a mare meant a horse not being born. In Egypt, mules were valued as riding animals; however, I am unaware of any evidence that they were widely used for caravan work outside mountainous regions in places like Afghanistan and Muslim Spain.

So now we come to camels, the world's most famous caravan animals. Carrying a 350-pound cargo and being able to endure without food (not to mention water) for many days because of the reserve of fat contained in their humps, camels eliminate most of the costs of provisioning a caravan. They can be tied in a line, nose to tail, so that a string of, say, six can be managed by one camel-puller. Six is also the number needed to carry our hypothetical ton of commercial goods. Considering that renting the animals and provisioning and paying that one camel-puller are your main overhead expenses, it is obvious that camel caravans made the overland bulk transport of fairly heavy but not-so-costly merchandise economically possible. We are talking about things like textiles, furs, paper, leather, non-luxury manufactured goods (e.g., soap, ceramics, worked metalware), and even some foodstuffs (e.g., honey, rice, dried fruit, and nuts). In other words, camel caravans made for a titanic change in the way of doing business and, for the first time, made overland transport competitive with transport by water.

7. Although Fernand Braudel first and foremost referred to maritime commerce, the emphasis you put on camel caravan trade for the overland transport of heavy merchandise seems to resonate with and reinforce Braudel's contention that: "Long-distance trade certainly made super profits; it was after all based on the price difference between two markets very far apart, with supply and demand in complete ignorance of each other and brought into contact by middlemen...the capitalist game only concerned the unusual, the very special or the very long-distance connection."⁵ Now, what were some of the changes that came with the advent of camel caravans?

Here are some of the changes ancillary to the advent of camel caravans that should be explored further:

- Everyday consumer goods made in different cities and regions could be transported to other markets with only modest price markups to cover the moderate cost of transportation. Thus, markets could diversify.
- Thousands of animals could be gathered in a single caravan because it was not necessary to carry or buy their provender *en route*.
- The concentration of commerce in such caravans made the hiring of guards (or payment of tolls and bribes) a reasonable expense and, thus, made overland travel safer for people who wished (for a fee?) to accompany the caravan on foot or donkey out of fear of banditry.
- Overland caravan routes could compete successfully for the first time with maritime trade since it was cheaper to protect against bandits than pirates, and shipwreck was not a factor.
- Inland cities not on navigable water, such as Nishapur, Bukhara, Aleppo, Qairawan, and Sijilmasa, could compete with sea, lake, and river ports in becoming entrepôts.
- Individuals of limited financial means could embark on long journeys, thus making it possible for Andalusians to show up in Iran, Central Asians in Egypt, and people from every Muslim land in Mecca. Personal travel, thus, became commonplace in medieval Islamic times, and not just for the well-to-do.
- The large quantities that could be transported encouraged the spread of new products and techniques as local artisans and farmers sought to compete with imported products. Thus, camel caravans facilitated the spread of new crops from East Asia that first appeared in Sasanid times.
- Monetization and the spread of readily exchangeable currencies found institutional support in partnership law, bills of exchange, and specialists in coinage values.
- Brokerage expanded as a means of doing business since buyers needed to consult specialists in one or another product to discover appropriate prices (occupational names such as *Dallal* and *Simsar*, both meaning "Broker," became fairly common, as did *Tajir* or "Merchant"). Market police (*Hisba* personnel) monitored urban commercial transactions.

5 Fernand Braudel, *Civilization and Capitalism, 15th-18th Century, Vol. 2: Wheels of Commerce* (New York: Harper & Row, 1982), 405, 456.

8. *In preparation for this interview, you indicated that the topic of brokerage deserves special attention and that we are often accustomed to thinking of transportation as secondary to the primary production in farms, workshops, and factories. People “own” the latter, but transportation is commonly conceived as simply facilitating exchange by moving products and commodities to markets. Conversely, in what you have termed the “camel caravan mode of production,” transportation takes center stage.*

In the camel caravan mode of production, transportation is an independent sector with its own set of “owners.” A farming community produces a crop, stores or consumes a part of it, and sees the remainder enter a more extended economy in one way or another. In a bartering or minimally monetized economy, the producers take their own surplus to a market or other point of exchange. In a feudal economy, landholders determine the entry into the wider economy of the surplus produced by servile or semi-servile laborers. In a capitalist economy, farms, mines, workshops, and factories are owned by individual capitalists or groups of shareholders. Labor is hired at the lowest possible wage to produce goods that are then transported by conveyances owned by the same or other capitalists or shareholder groups.

In the camel caravan economy, providing bulk transportation involves coordinating a network of factors, which is more complex both socially and geographically. Pastoral nomads breed and herd beasts of burden and generally value themselves by the size of their herds rather than the sale prices realized by selling or renting a few animals. Individuals or organizations that enjoy the freedom of movement and (relative) immunity from harm roam the deserts buying camels, herding them to markets, and selling or renting them to end users, including caravan organizers. In twentieth-century Arabia, the buyers’ guild was known as the Bani ‘Uqail.

Farmers or other primary producers do not own a means of transportation beyond their immediate geographical horizon. A camel, ox, or donkey used to operate a mill or irrigation device cannot be also used for journeys to distant places. Thus, the person who organizes a caravan must exploit links with desert pastoralists and livestock handlers and, at the same time, know when and where there are bulk loads that need lifting. Villagers or other producers wait for the camels to come for their crops or goods and trust the caravan merchant to pay them a fair price. Needless to say, the merchant’s assessment of a fair price depends on knowing the prices that different commodities will bring not just at the end of the trek but also in a variety of markets along a given caravan track. The merchants and their partners also need capital to purchase the cargoes they wish to carry—this may be a huge amount if the cargo is carried by thousands of camels. Thus, they also need access to banking and insurance instruments. But there is little evidence that their capital derived from ownership of farms, mines, workshops, or factories.

9. *In your view, was the “camel caravan mode of production” pre-capitalist or rather merchant capitalist? And could you please also tell us more about the specificities and intricacies of the caravan system?*

The camel caravan mode of production might be conceived of as a variant of the European merchant capitalism that structured seaborne trade well into modern times. However, the complexity of the caravan system was greater. A maritime merchant needed to buy goods, arrange for their

passage on ships, which were usually owned by other people, and then hope that his estimate of the market was accurate enough for him or his agent to return home with a fair profit. How the goods arrived at the point of export and got distributed at the other end of the voyage was likely the responsibility of other people. In the case of camel caravans, however, long-distance transport often linked up with more localized transport nexuses where goods were assembled for transport or distributed to buyers. Moreover, while the open seas did not have political boundaries, caravan traders had to know about, and be able to negotiate with, the various jurisdictions, both governmental and tribal, through which they intended to pass.

10. *Your analysis corroborates one of the dominant historiographical trends in writing the history of merchant capitalism in West Asia between the eighth and fifteenth centuries. Since the mid-1960s, this scholarship—ranging from Maxime Rodinson and Subhi Labib to Murat Çizakça and Jairus Banaji—inferred that the age in question was marked by a “capitalist sector” and “commercial capitalism.”⁶ You are perhaps the foremost scholar to add the dimension of transport to this literature. Now in what sense were local inhabitants aware of the substantial commercial transmutations that occurred in the wake of establishing the camel caravan system?*

Arabs were aware of the commercial revolution represented by camel caravans long before the agriculture-based societies in the lands bordering the Arabian desert. When the Quran likens camels of ships (*fulk*) in Surat al-Mu'minin, verse 23, I believe there was a consciousness of the degree to which overland caravan trading was becoming truly competitive with ship-borne commerce. In addition, the very specific listing of “cutting the highway”—but not murder, kidnapping, arson, etc.—as one of the five Quranic *hudud* violations in Islamic law shows concern for caravan security analogous to the centuries-long obsessions of Rome and China with suppressing piracy. The phrase “cutting the highway” does not actually appear in the Quran. Topping these indicators is the abundant evidence and imagery related to the caravan god Dusares, who was revered in the Arab caravan city of Palmyra and elsewhere.

Rome absorbed the caravan cities of Petra and Palmyra, and Arabs began to conduct commerce with and within Iran under the Sasanid Empire. But the Arab conquests after the death of Prophet Muhammad were required to establish camel caravan commerce on an imperial scale—not to mention supplying thousands of camels to far-flung frontiers as part of the armies' logistic trains.

11. *You have made clear how the camel caravan trade affected the market. But how did it impact the organization of society at large?*

The camel caravan mode of production was not simply a matter of market efficiencies and higher profit margins. It affected the structure of society. Here are some of the consequences we see taking root in early Islamic times and characterizing “Middle Eastern” society for a long time afterward.

6 Full reference to these works is available in the “Introduction.” See also the interview with Jairus Banaji in this volume.

- The pilgrimage to Mecca provided regular annual revenues and rents for camel-breeding pastoralists and ensured that all pious Muslims became personally familiar with the conditions of caravan travel. Even those arriving at Jidda by sea had a major trek over the Hijaz mountains to get to the Haramayn, the holy cities of Mecca and Medina.
- Large (100,000+ population) inland cities without access to water-borne transport became possible for the first time. The cities that grew up around Iran's central desert (Nishapur, Ray, etc.) found parallels in Qairawan in Tunisia and Sijilmasa in Morocco. The negligible energy cost of bringing in foodstuffs, charcoal, and building materials played a major role in this. By comparison, Florence, a comparable Italian city in Renaissance times, imported half of its food provisions by sea.
- Caravans became the normal mode of goods transport and gave rise to rural caravanserais along trade routes, animal mustering areas (*mirbad*) on the outskirts of cities, and urban *khans* and *funduqs* in which caravan goods were warehoused and then transported around town for wholesale distribution.
- New routes became possible across terrains that were too rough, barren, or dry for ox-carts or other pack animals. (Many people note quite rightly that camels are wonderful on the sand, but major caravan routes across sandy wastes were almost exclusively Saharan. "Middle Eastern" routes were typically stony.)
- The nomadic sector of the population was accepted as a normal and necessary part of any polity despite its remoteness from government control and, for the most part, Islamic law. Forcible settlement seems not to have taken place at a significant level until post-Mongol (or even modern) times.
- Hydraulic lifting devices and mills had similar designs from Morocco to Afghanistan and typically utilized a single animal in harness, though not always a camel. This form of energy was so cheap that the "Middle East" never experienced the cost squeeze that led Europeans after 1200 to invest increasingly in water and windmills. There was no technical lack in the "Middle East," but animal power remained too cheap to justify the high initial investment in such mills.
- Intercommunication between different regions became commonplace, and along with it came cultural similarities across boundaries that had hitherto, even in periods of imperial expansion, been largely uncrossed (e.g., Egypt and Mesopotamia; Central Asia and Iraq; north and south sides of the Sahara). Currencies became fungible across vast distances. Arabic and later New Persian became *linguae francae*.

12. *You suggest that the transformations brought about by the camel caravan trade do not stem from religious or cultural practices, views, and principles. Were they solely based on economic factors?*

With the exception of pilgrimage, none of the above phenomena required Islam as a religious/cultural foundation. Muslim societies outside the Arid Zone, in Southeast Asia, for example, did not share economic characteristics with the camel caravan region. Nor did Christianity and Buddhism, which spread with similar success, engender degrees of economic intercommunication or cultural expression comparable to those found—for non-Muslims and Muslims—within the camel caravan realm.

What is at play, in my opinion, is the development of a distinctive mode of production, which grew in its initial stages during Roman and Sasanid times and then culminated in the rise of Arab dominion. An important mark of the success of this mode of production was a vast extension of territory where camel pastoralists maintained large herds of animals. Iran, Afghanistan, Pakistan, and Northwest India were mostly outside the range of camel pastoralists in the pre-Islamic era. This quickly changed. In some areas, particularly along the Silk Road (Khurasan Highway), Arab military encampments introduced thousands of one-humped animals into the region. But farther south, in what became Baluchistan, southern Afghanistan, Sind, and Rajasthan, the pastoralists who took to camel breeding seem to have less direct contact with Arab tribes.

North Africa has a separate history in which, I believe, Roman Tunisia and Tripolitania developed camel pastoralism when the Roman economy fell apart in the third century, and local farm laborers took the camels they used for plowing and cart pulling—highly unusual activities for camels at that time—and seized territory for themselves in the northern Sahara. When the Arab armies reached that far west in the early eighth century, they encountered these locally developed nomadic populations and eventually Arabized them. From an economic point of view, however, this was a union of two different camel-breeding zones, “Middle East” and North Africa. A third zone was found later in the southern Sahara, which adapted easily to the northern caravan economy. Egypt was less amenable to changing from sea and river transport to caravans and, unlike Sudan, did not become a major camel-breeding region. Pastoralists herding two-humped camels provided yet another component of camel caravan trading from Central Asia to northwest China.

13. How would you delineate the historical trajectories that led to the underlying patterns of growth and decline of the “camel caravan mode of production”?

In broad strokes, here is the historical scenario encompassing the rise and demise of the camel caravan mode of production: The ancient Near East was based economically and politically on river valleys and mountains. Egyptians, Hittites, Sumerians, Babylonians, Assyrians, Persians, and myriad others built their cultures on either valleys or highlands and maintained them in distinction to other cultures when their political fortunes enabled them to grow from localized principalities into empires.

This pattern gradually changed in the first half millennium CE. A hallmark of the change was the increasing salience of the Arabs and their way of life to the region’s political economy. The rise of the Arabs to political dominance under the banner of Islam culminated this process of change, opening the conquered territories to the expansion of the developing camel caravan mode of production. By the time of the Mongol invasions of the thirteenth century, this new pattern was suffering from internal and probably climatic problems. Yet another structure was coming into being, one that reverted in some measure to the Mediterranean seaborne economy of pre-Arab antiquity but also retained a limited involvement with the type of long-distance overland trade that had developed during the era of Arab dominance. The Ottoman, Safavid, and Mughal polities exemplify the new structure.

As mentioned, the hallmark of political economy of the Arid Zone in the camel caravan era was lowering the cost of energy through the spread of camel use. Unlike horses and oxen (though less so donkeys), camels rarely require purpose-grown fodder. They are nurtured in desert

environments and eat plants that are sparsely distributed and often too woody or thorny for other animals. When worked, beginning around age four, they may sometimes be given grain, but normally they simply browse during a caravan's downtime—one front leg can be hobbled to allow the camel to graze without being able to wander far—or they go without eating entirely and derive working energy from the fat in their humps. Consequently, camels afford a nearly cost-free energy source so long as you have access to three things: wastelands and deserts for grazing, pastoralists who accept the hardships of living with the animals in those deserts, and mechanisms for collecting and marketing the animals to merchants and settled peoples who value their qualities. These conditions began to come together during imperial Roman times, but they did not become region-wide until pastoral Arab tribes moved out of Arabia on a large scale in conjunction with the creation of the Islamic state.

Camels yoked (awkwardly) for plowing did not displace oxen, but ox-carts all but disappeared, and one-humped pack camels became ubiquitous as goods transporters from southern Iran eastward through southern Afghanistan, Pakistan, and northern India—regions that had not had them before the Muslim era. Though the human counterparts of this rapid livestock revolution—think a comparison with Native American responses to Europeans bringing horses to the New World—have not been studied, comparable attempts to naturalize camels to new environments around the world clearly show that transplantation does not take place successfully without accompanying pastoralists and a desert-to-sown marketing nexus.

We lack a history of the Bani 'Uqail, the guild of camel marketers that funneled tens of thousands of working animals every year from the Arabian Peninsula into surrounding agricultural zones in the early twentieth century, but similar mechanisms must have been available earlier. The marketing of camels from Sudan into Egypt along the Darb al-Arba'in and from the Sahara into Morocco by way of the town of Guelmim (Goulimine) are but two of what must have been many ways of connecting the deserts' livestock with consumers.

Prior to the Arab conquests, the growing impact of camel use was largely confined to the transport sector. Wheeled transport largely disappeared, and Arab caravan cities came into existence. When the conquests commenced, however, their trajectories traced caravan routes that merchants had become familiar with in earlier decades, notably excluding Byzantine Anatolia, which had winters too cold for Arab camels, and Sudan and Ethiopia across the Red Sea. Arab armies also shifted many thousands of animals to locales like Marv and Balkh, thus providing the basis for breeding industries that produced super-strong hybrid crosses (Arabic *bukht*) between two-humped sires and one-humped dams. The hybrids were never used for breeding a second generation because their offspring were puny, but the industry provided particularly valuable caravan animals.

With the caliphal empire that came into being as a result of the Arab conquests, as with any developed economy, what goods could be produced and in what quantities was a matter of matching supply with demand and production with distribution. When supply and demand are essentially local, every community or sub-region develops its own production pattern. But when demand changes because of a major shift in the cost and ease of supplying products to new consumers over longer distances, new horizons open up in the area of industrial production. Prior to the advent of animal labor, mode of transport changes of significant magnitude had almost always dealt with the movement of goods by water. But the spread of camels from Arabia into other Arid Zone environments and their development as caravan animals gave the caliphate a mode of

transport that brought inland cities and regions into contact with each other, and with a broader world of exchange, to a greater degree than ever before.

Looking from the slightly different perspective of distribution as a limiting factor in industrial production, it is important to recognize that marketing involves transportation in two different ways: moving products to consumers and moving consumers to products. The railroad, for example, transformed industrial production by making it possible to move vast quantities of goods cheaply to towns where retailers, many of them neighborhood stores, could acquire them for their customers. Then the automobile transformed marketing again by enabling customers to travel long distances to malls, supermarkets, and big box stores and transport their goods home.

In the economy of the early caliphate, the absence of wheeled transport meant that customers walked to shops that were often extensions of artisan workshops. Clustering shops selling the same variety of goods minimized walking and lent a particular character to the market, which we still recall in the words *Souq* and *Bazaar*. Acquiring goods was much harder for rural residents since they were limited on trips to town by what they could carry home with them or, for a few, what they could put on a donkey. There were no wheelbarrows, no pushcarts, no oxcarts: just walk and carry. I would hypothesize that the gap between the material possessions of villagers and those of city-dwellers was greater in the caliphal lands served by caravans than in Europe or China where wheeled transport—provided mostly by wheelbarrows in China—became increasingly available.

In the long run, the burgeoning trade between cities that followed the expansion of caravan trading proved a limiting factor in terms of expanding a non-urban consumer society. Without the improvements in wheel technology that began with Europe's sixteenth-century carriage revolution, the Arid Zone did not experience the growth in market networking that culminated in the railroad and automobile modes of transport.

The slow demise of the camel caravan mode of production involved several simultaneous developments, including:

- Increasing political disorder and loss of a consumer base in Mesopotamia, the customary western terminus of the Silk Road, that culminated in 1268 when Mongol invaders destroyed Baghdad, a metropolis already in an advanced state of decay.
- A northward shift of caravan routes into Anatolia, where hybrid animals were needed to fight off the cold of winter; caravan work here focused on seaports like Smyrna (Izmir) and Trabzon.
- Major advances in maritime trading technology from the fifteenth century onward.
- The entry of European warships into the Indian Ocean, first imposing imperialist order on shipping in the region, i.e., relabeling local competition as piracy.

While camel caravans continued in most parts of the Arid Zone, they lost their competitive edge over seafaring and were increasingly used to service seaports. Camel-breeding nomads slowly reverted to their pre-caravan role as semi-civilized tribes whom governments could not control and whom city folk, villagers, and pilgrims viewed with distrust and (increasingly) disdain. As the Orientalist profession developed during this period of growing obsolescence, the image of the camel as a stereotypical sign of backwardness—and camel pastoralists as non-productive and obsolete contributors to the economy—became set in stone. Thus, the great era of the camel caravan mode of production as the key economic structure interconnecting most of the Arid Zone in the Eastern

Hemisphere from 20 to 40 degrees north latitude between 300 and 1400 CE came to be relegated to the dustbin of historiography. It is time now to go back and sort through that dustbin.

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