



INTRODUCTION TO EQUESTRIAN MAN AND TO *EQUUS*

THIS BOOK EXAMINES THE EMERGENCE OF HORSEPOWER IN HUMAN society and its cultural ramifications around the globe over the last 6,000 years. Within anthropology, cultural advance has traditionally been viewed in the context of the sedentary agricultural state. But the horse, in its original evolution in North America and repeated radiations and extinctions worldwide, developed the anatomical features to become the fastest distance-running quadruped on earth in arid regions of poorest forage. To assess the impact of the horse on human culture then, we must turn first, not to the well-watered heartlands of pristine civilization, but to the steppes and deserts of our world. Consideration of these peripheral zones will both challenge and complement existing theory by exposing important data entirely overlooked in previous interpretations. Analysis of man's symbiosis with the domesticated horse necessarily takes the reader to regions remote from urban centers and pays special attention to mobile elements of nomadic society, too often deemed marginal or transitory. Horse domestication probably first occurred in the fourth millennium BC on the Eurasian steppes, a great expanse of grasslands stretching eastward from Hungary for more than 6,400 km to the borders of China. Tribes of that vast peripheral area were notoriously responsible for the depredations and invasions that over the millennia threatened the heartlands of civilization to the west, south, and east. While it is true that mobile horsemen from the steppes relentlessly harassed the imperial armies of sedentary states, it is also true that their far-ranging routes across forbidding mountains and deserts afforded rapid transport of distant trade goods, both essential and exotic. With trade went cultural exchange: adoption of different cultigens, implementation of new technologies, introduction of foreign inventions, dissemination of ideas, diffusion of religions, the

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spread of science and art. The history of the horse and its extraordinary impact on human culture explores this dual reality. On the one hand, the increasing effectiveness of the war horse – its sophisticated armature, weaponry, and superior military force – wrought utter destruction in war; yet in the wake of conquest, rapid horsepower greatly extended the scale and complexity of civilization. The current work traces the rise of Old World equestrianism across Asia, Europe, and North Africa and in the final chapters describes the devastation of the equestrian conquest of horseless Amerindian societies, citing it as model for subsequent Atlanto-European planetary expansion and colonization. Throughout the book ideology is considered: the great epics that inspire and inflame equestrian militarism.

SIX THOUSAND YEARS OF HUMAN–EQUINE RELATIONS

From the perspective of movement from the periphery and always noting the dual character of horsepower, its destructive and constructive qualities, this work undertakes to identify the technology, tactics, and ideology that allowed equestrians of different epochs and geographical areas to dominate with the horse wide expanses of arid and semiarid lands and, by successfully traversing these barren regions, to disperse important new ideas and inventions across continents. To document early nomadic movement across the Eurasian steppes and later military invasions with the horse of sedentary centers of civilization in the Old World and later the New World, six major migrations of progressively broader scale are recognized.

1. FOURTH TO THIRD MILLENNIUM BC: PASTORALIST PIONEERS ACROSS THE EURASIAN STEPPES. In the fourth millennium BC, Indo-European agriculturalists of the Pontic-Caspian region, already practicing herding and metallurgy, initially domesticated the horse. The resultant horse culture facilitated early extension west into Europe and rapid advance eastward across the Eurasian steppe interior with successful adaptation to that inhospitable environment. Techniques of adaptation are discussed in terms of steppe exploration: wheeled vehicles, portable dwellings, weaponry, primitive irrigation, and bronze, gold, and iron metallurgy. Nomad ethos is also examined in the art and ceremony of the great funerary tumuli scattered the entire length of the steppes. The extreme mobility of agro-pastoralism ranging over thousands of

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kilometers is contrasted with the sedentariness of circumscribed alluvial states emerging in Asia and North Africa during this epoch.

2. SECOND TO FIRST MILLENNIUM BC: STEPPE INVASIONS OF OLD WORLD CIVILIZATIONS. After 2,000 years of successful agropastoralism, the high mobility achieved allowed expansion out of the marginal steppe habitat, military invasion of urban centers of sedentary civilization, and the establishment by horse charioteers of states in those ancient nuclear areas. In the Near East, North Africa, Iran, India, and China, iron weaponry and war chariots dominated the battlefield, the ancient scriptures of the *Rgveda* and *Avesta* reflecting this expansionary might. In the second millennium BC, the Hittites employed rigorous techniques in training the chariot horse and were the first to deploy horsepower in the coercive relocation of vanquished populations to frontier zones of their Anatolian state. At the end of the second millennium BC, the recurved composite bow facilitated the transition from battle chariot to war horse. At the beginning of the first millennium BC, while steppe mass chariotry attacked China in the east, military cavalry first appeared on the western steppe. Through selective breeding, the Iranian-speaking Medes produced a larger horse fully capable of carrying an armed warrior with combat weapons. Cavalry and chariot conquests culminated in the first far-flung equestrian empires that effectively absorbed earlier nuclear states, the Achaemenid in the west stretching from India to the Mediterranean, the Qin in the east encompassing the whole of China. Astonishingly, introduction of advanced horse technologies to these two regions, separated by vast distances, triggered identical parallel developments at opposite ends of Asia. In both empires thousands of kilometers of roads were constructed for equid transport; a unitary language and writing system were imposed; and coinage, weights, and measures were standardized across the realm. Burgeoning overland trade consequently spurred maritime commerce. In China canals were built to transport foreign commodities from southern ports deep into the interior. In the west a canal, wide enough for two ships to pass, was dug between the Red Sea and the Nile to link trade from the Indus to the Mediterranean.

3. TURN OF THE ERA: MEDITERRANEAN EQUESTRIAN MILITARISM. By the end of the first millennium BC, the war chariot and then cavalry had been introduced to all centers of civilization across Eurasia

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and North Africa, whether by outright conquest or deliberate acquisition. The ancient megalithic structures of prehistoric Europe are first described in their important ceremonial function as solar centers of equestrian ritual. Europe's equestrian militarism is then discussed in terms of early intercontinental confrontation during the Trojan war, later Greco-Macedonian defiance of Asia's Persian might, Hannibal's Punic invasion of Spain and Italy, and Rome's near defeat and subsequent adoption of Carthaginian cavalry tactics to colonize most of Europe and the Mediterranean littoral. Rome's military power was celebrated with great pomp in the solar racetracks and amphitheaters of the empire. By the turn of the era, trade was bustling along the nomads' Silk Road as exotic products were exchanged between Occident and Orient. Great religions – Buddhism, Judaism, and Christianity – also diffused on horseback along the routes linking Europe, India, and China. But as warring equestrian tribes continued to invade Europe from the steppes, Rome's strength ebbed. In the sixth century AD, the Mongol Avars brought an important Chinese invention west, the metal stirrup, which allowed the rider to grip the lance in a couched position and to attack an adversary with the full force of his charging horse, a factor of critical significance in the later development of medieval knightly warfare. As Rome retreated, Arthurian legends of great equestrian heroes arose in the north to inspire medieval traditions of chivalry.

4. LATE FIRST MILLENNIUM AD: ARAB EQUESTRIAN ASSAULT FROM THE SOUTHERN DESERTS. In the south, Byzantine dominance in the Mediterranean was challenged in AD 636 by equestrian nomads from a new periphery, not the northern steppes as before, but the southern deserts. Supported by the dromedary, Arab horses sped across the deserts of the Middle East and North Africa, conquering as far as Sasanian Persia in the east, Visigothic Spain in the west, and south across the Sahara to tap the gold wealth of Ghana. Building on earlier Egyptian, Babylonian, Jewish, Hindu, and Greek scholarship, Arabic learning soared to new heights of human endeavor as scientists and philosophers of different ethnic backgrounds pursued knowledge in diverse disciplines, with rapid communications permitting an exchange of ideas unprecedented in earlier civilizations. But religious strife struck stark divisions in Islamic society; bitter feuding occurred between Umayyads and Abbasids, Sunni and Shia, schisms that to this day rend the region apart and are ever immortalized in the great epic of *Taziyeh*. This political strife was further exacerbated around the turn of the millennium

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by nomadic Seljuk incursions into the region and the later Crusader challenge to Islam from the west. During the Crusader-Saracen conflict in the Levant, from western Europe to the eastern Mediterranean, there developed the world's first systematic long-distance maritime transport of horses. We also note during this period the emergence of the equestrian military orders – Christian warrior monks and Muslim slave Mamluks – and their enduring influence over political developments of later centuries respectively in Europe and the Middle East, until the time of Napoleon.

5. EARLY SECOND MILLENNIUM AD: ALTAIC NOMAD CONQUEST OF EURASIA. From 2000 BC to AD 1000 armies invading from the peripheral steppes and deserts had succeeded only in partial conquests of Eurasia; this invasion pattern, however, was shortly to escalate. Early in the second millennium AD there erupted in furthestmost Mongolia an equestrian military force that was to convulse both continents. Employing Chinese siege technology as no nomads had before and following audacious military strategy, the Mongol conquest extended from the Pacific to the Baltic to persist for several centuries in the form of distinct khanates. In the aftermath of brutal massacres and tumultuous destruction of the environment, technicians were exchanged across the length and breadth of Asia, luxury industries resulted that reflected the talents of many lands, intercontinental trade flourished, and scientific exchange followed; great Chinese inventions – printing, gunpowder, and forged steel – flowed west to Europe to bridge the gap between the medieval and modern eras. With the sack of Constantinople in 1453, the Ottomans emerged as successors to the Mongols, with Turkish horses invading Europe as far west as Vienna. In the face of this latest invader from the steppes, countries of western Europe turned desperately to the oceans in order to circumvent the Muslim stranglehold of Middle Eastern trade routes.

6. LATE SECOND MILLENNIUM AD: ATLANTO-EUROPEAN EQUESTRIAN WORLD CONQUEST. Having successfully traversed the Atlantic, on his second voyage to the Americas in 1493 Columbus astutely introduced 50 warhorses to the hemisphere where the horse had been extinct for 9,000 years. Profiting from Crusader experience in long-distance horse transport across the Mediterranean, from Europe's westernmost fringe Spain promptly dispatched hundreds of horses, enabling mounted Christian knights to topple two advanced civilizations and in a brief few years to

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conquer more than 25 million people. Contrast is drawn between the technological achievements of Old and New World cultures at the time of contact, with notable differences attributed to horse presence and absence in the two hemispheres. Absence of the horse clearly placed Amerindians at a disadvantage in terms of military organization and inter-polity communication. The devastation of Europe's equestrian conquest of horseless Amerindian societies is then described as model for subsequent European maritime exploration in which, financed by the vast wealth of the New World, nations of the Atlantic seaboard took to the oceans with their ships and horses to colonize other horseless lands around the globe. In uncharted regions, horses provided vital transportation for the development of agriculture and industry. But as gunboat diplomacy reigned at sea, equestrian warfare raged on land. By successfully introducing horse rearing to arid Australia in the early nineteenth century, then shipping half a million Australian warhorses to military campaigns across Asia and Africa, Britain quickly gained the competitive edge in empire building to outstrip all European colonial rivals. Thus, while accelerating the rate of progress, well into the twentieth century the horse's speed and strength also conferred a military might that inflicted untold suffering on millions. As heirs to six millennia of horse power, in today's hypermechanized era of "iron horses," "horseless carriages," and "winged Pegasus" encircling the earth, we must recognize that rapid technological advance and economic expansion often have been accomplished at great human cost and have contributed significantly to environmental degradation. As our wars continue unabated, the final chapter examines critically our horse legacy from the past – the modern obsession with speed, our insatiable consumption of the world's resources, and, in our unrelenting drive for acceleration, the irreversible destruction of our planet.

WILD EQUIDS – c 60 MILLION YEARS AGO TO THE PRESENT

Before we embark on man's high-speed adventure on horseback, first let us try to recapture a more ancient epic, that of the wild horse itself – long, long before its domestication. *Homo* as a bipedal hominid first evolved some six or seven million years ago. The genus *Equus*, which includes the modern horse and its closest relatives, the asses and zebras, by contrast is the result of more than 55 million years of highly specialized evolution in the development of rapid forward locomotion, revealed to us in an abundant trail of robust fossil limbs across most continents.

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Equid Paleontology

The family *Equidae*, the horse family in its broadest sense, subsumes modern *Equus* and all fossil relatives derivative from the ancestral line as far back as the Eocene. In that distant epoch, the earliest equid to become differentiated from ancestral *Perissodactyla* was *Hyracotherium*, or “dawn horse.” A timid herbivore between 25 and 50 cm in height, it was adapted to browsing succulent leaves, soft seeds, and fruits of the forest. Over the next 60 million years many evolutionary changes would transform this diminutive creature into the robust horse we know today. In *Hyracotherium*, the heel of all four feet was raised above the ground, the weight of the body being carried on padded digits¹ or toes. This, combined with the slight lengthening of the toe and shin bones, gave added distance from knee to ground that greatly facilitated running (Simpson 1951:116–119). Another perissodactyl innovation was the astragalus bone in the ankle joint, which has two raised parallel ridges at the point of articulation with the tibia. This type of joint permits ease of flexure in a fore and aft direction but minimizes wasteful lateral movement and the possibility of dislocation, an early adaptation, it would seem, to high-speed travel over distance (Hulbert 1996:17). By 58 million years ago, hyracotheres had encircled the planet, only to become extinct in Eurasia during the Oligocene. This pattern of global radiation and Old World extinction would occur repeatedly before modern *Equus* finally evolved in North America (Fig. 1.1).

Equids survived in North America to follow a distinct evolutionary course. During the Oligocene, a series of changes occurred in *Mesohippus* and *Miohippus*, both of which stood about 6 hands or 60 cm.² One significant feature of the hind leg distinguished *Miohippus* from *Mesohippus*. The cannon bone, that is, the metatarsal of the middle toe, previously in contact with a single ankle bone, now articulated with the outer ankle bone, thereby forming a broader, stronger joint. All four feet of these two equids had only three toes (tridactyly), the middle toe being much larger than the side toes (Simpson 1951:124, 127); retention of side toes probably provided greater traction on muddy surfaces and lateral stabilization when turning at speed to avoid bushes and trees (MacFadden 1992:259). The late Oligocene was an important time of

¹ In all perissodactyls, the first digit (equivalent of the human thumb or big toe) is missing on fore- and hindfeet, as is the fifth digit on hindfeet.

² An equid's height is calculated in hands; 1 hand equals 4 in. or 10.16 cm. This measurement is taken from ground level to the highest points of the horse's withers.

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branching and radiation as different lines developed from *Miohippus*. But, again during the Miocene, many of these equids became extinct as increasing global aridity led to the reduction of forests and the spread of grasslands, conditions under which many other browsing herbivores perished at that time (MacFadden 1992:160–161; Hulbert 1996:23–24).

In these open terrains of the Miocene a new rich food supply became available – grass. As a mixed feeder *Parahippus* was transitional between browsing and grazing. But grasses were hard to digest because the cell walls contained highly resistant lignin and silica. In the new equid adaptation of grazing, extensive chewing was required to break down the tough phytoliths in order to release the nutritious cell contents. To exploit this new food source, radical transformations were needed in dentition (MacFadden 1992:229; Simpson 1951:131). To cope with the harsh diet of grass mixed with abrasive grit, hypsodonty (long-toothedness) evolved progressively in the successive genera of *Parahippus* and *Merychippus*. High-crowned cheek teeth with deep ridges were developed. With this increase in crown height, only the end of the crown protruded from the gum, leaving the remainder buried in the socket, reserved for future use. With wear the whole tooth kept moving outward to maintain an efficient grinding surface over a prolonged period, significantly extending the lifetime of the animal. The final result, completely developed in *Merychippus*, was cheek dentition admirably adapted for laterally grinding the lower jaw against the upper. Also important for long-distance travel across grasslands was the equid digestive track, which, in contrast to the bovid divided stomach with rumen, had alongside the large intestine a developed cecum, housing symbiotic microorganisms that digest the cellulose of grass. The cecum in modern *Equus* measures 1.25 m in length and has a capacity of 30 L. This meant that equids, unlike cattle, did not need to rest after feeding in order to ruminate (Clutton-Brock 1992:21–22; MacFadden 1992:237; Simpson 1951:132–135).

In both *Parahippus* and *Merychippus*, while the two vestigial side toes persisted, all body weight was supported by the convex hoof of the third central digit. Also, the ulna of the lower forefoot in *Merychippus* had fused solidly with the radius to form a more rigid structure in adaptation to fast running on hard surfaces. Strong ligaments ran from the central metapodial to the rear of the lengthened toe bones to provide support and springlike action to the foot, developments occasioned by the real need for a more rapid gait (Hulbert 1996:24). Geological evidence of this epoch points to increasing aridity and open

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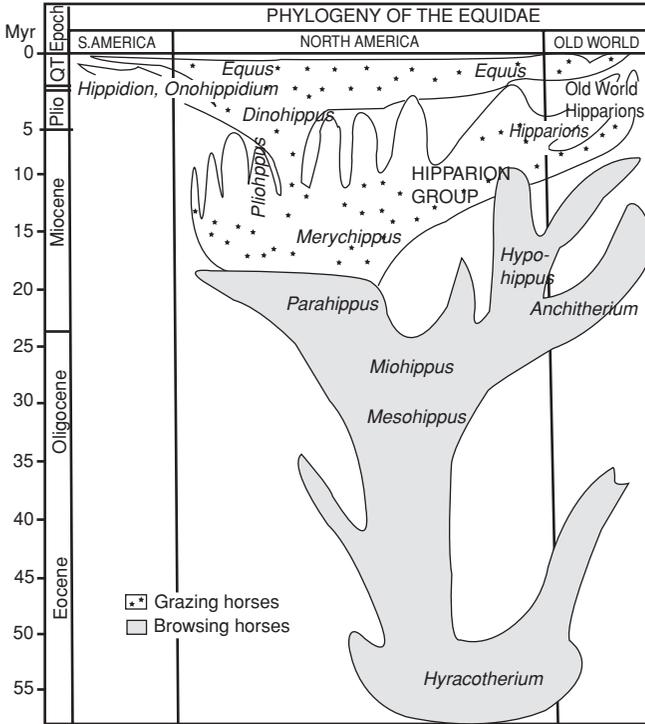


FIGURE 1.1. Evolution of equid genera leading to the emergence of *Equus* 4.5 million years ago (after MacFadden 1992:fig. 5.14). Reprinted with the permission of Cambridge University Press.

country. As body size increased to 10 hands so did equid longevity and home range. During different seasons of the year, equids would have ranged widely in the search of patchy food resources. Such increased cursoriality would have led to the development of greater stamina in the locomotory system of equids. At the same time, in an open habitat the equids were more visible and thus more vulnerable to predation. Speed was therefore at a premium, not only for finding food, but also for escaping swift mammalian predators (MacFadden 1992:260). These important adaptations occurred at a time when abundant grasslands afforded a new ecological niche for equid evolution.

The late Miocene was characterized by great generic diversity in which these new adaptations were further developed into the Pliocene by successive species of tridactyl grazers. *Merychippus* was superseded by tridactyl *Hipparion*, which in terms purely of dentition was the most advanced equid ever and effectively migrated across the Old World

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(Hulbert 1996:27). But the next extremely important innovation took place in eastern North America. There in *Pliohippus* the two side toes were lost, becoming vestigial splints beneath the skin of the upper portion of the foot and resulting in one digit per foot – monodactyly (Fig. 1.2). The “chestnuts” and “ergots,” horny outgrowths of skin visible on the limb surface, are vestiges of these ancestral toes. Toward the end of the Miocene, in the west later monodactyls evolved in the arid intermontane basins of Utah to become the earliest members of the *Equus* lineage. Around this time global climates underwent drastic change, transitioning into cyclic glacial/interglacial ages. The rich savannas were replaced by less diverse grasslands, and many savanna species became extinct. Better suited to earlier moist habitats, tridactyls perished in North America by the late Pliocene, only hipparionines persisting in parts of the Old World until the mid-Pleistocene.³ As will be seen in the chapters ahead, such massive extinctions of tridactyls would have future repercussions for human culture. Monodactyls, superbly suited to drier climes, would spread widely across the arid and temperate zones of the planet but never adapt to the earlier tridactyl habitat in moist regions – particularly the tropics. After 7 million years ago, the monodactyl *Dinohippus* dominated the North American continent until c 4.5 million years ago when *Equus* finally emerged. By the mid-Pleistocene *Equus* had spread to South America, where it coexisted with earlier immigrants, the monodactyl *Hippidion* and *Onohippidium*. In an intricately branching and radiating process, *Equus* also populated the Old World. Early differentiated in the sub-Saharan Pleistocene were the progenitors of modern zebras. The other groups of *Equus*, the asses and the horse (ancestor of modern wild and domestic horses), probably originated in North America 1.5 million years ago, the asses dispersing to the Old World 900,000 years ago, the horse somewhat later becoming very successful across Eurasia (Hulbert 1996:28–32).

Ironically having populated most of the globe and successfully survived the last Ice Age, *Equus* became extinct 9,000 years ago in South and North America, the latter the locus of its 60 million years of evolution. It is unclear what precipitated this extinction. Vast herds roamed during the Pleistocene and the prairies were relatively unaffected by the glaciers, but camelids and mastodons too became extinct in North

³ The Quaternary geologic period is divided into the Pleistocene epoch, which began 1.6 million years ago, and the most recent Holocene epoch, dating from 10,000 years ago.